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REGIONAL MANAGEMENT OF SCIENTIFIC, TECHNICAL PROGRESS

Moscow IZVESTIYA AKADEMII NAUK SSSR: SERIYA EKONOMICHESKAYA in Russian No 5, Sep-Oct 84 pp 37-48

[Article by N. G. Chumachenko and N. N. Yermoshenko: "The Regional Aspect of the Management of Scientific and Technical Progress"]

[Text] In the article the basic methodological questions of the formation of the mechanism of the regional management of scientific and technical progress are examined. On the basis of the made theoretical analysis and with allowance made for the already available practical experience the authors advance specific proposals on the formation of the system of the territorial management of scientific and technical progress on the regional level.

The appearance and the gradual strengthening of the role of the regional aspect in the management of scientific and technical progress are an objective process, which is due to a large number of significant factors and prerequisites and to the need for the quickest accomplishment of major tasks in the area of the development of science and technology. Member of the Politburo of the CPSU Central Committee and First Secretary of the Ukrainian CP Central Committee Comrade V. V. Shcherbitskiy groups with such tasks on the regional level: the formulation and use with allowance made for local conditions of specific forms and methods of combining the achievements of the scientific and technical revolution with the advantages of socialism; the determination of the basic directions of scientific and technical progress and the ratios in the development of basic research for the solution of the national economic problems of regions; the improvement of the management, planning and stimulation of scientific and technical progress in each region [1].

The process of the strengthening of the regional aspect in the management of scientific and technical progress is due first of all to the need for comprehensive (sectorial and regional) influence on the economic, social and ecological consequences of scientific and technical progress, both positive and negative. The continuous increase of the rate of industrial production and the development of the scientific and technical revolution had the result that in practically every region of the country certain limitations with

respect to nearly all types of resources have appeared, the ecological situation is being complicated, that is, along with positive consequences negative consequences of scientific and technical progress are also occurring. Sectorial organs alone, of course, are not capable of "discerning" such negative consequences of scientific and technical progress simultaneously in all regions of the country, and all the more so of effectively influencing them. As for territorial organs, for the present they do not yet have adequate real means for this, although they do have specific powers in conformity with the USSR Constitution and in most cases do not remain indifferent to consequences of this sort.

Territorial organs are also not capable of fully utilizing for the support of the comprehensive economic and social development of their regions the positive results of scientific and technical progress and its enormous socioeconomic potential, since at the level of the region scientific and technical progress for the present is practically unmanageable. A serious contradiction has formed: scientific and technical progress has turned into a decisive factor of the economic and social development of any region, and at the same time local organs lack the means to influence it.

At the present stage of the development of the economy the demands on the assurance of the unity of state scientific and technical policy at all levels of the national economy: in the economy as a whole, sectors, regions and primary units, are increasing. At the June (1983) CPSU Central Committee Plenum the decisive importance of a unified state scientific and technical policy was stressed. And whereas on the level of the national economic complex of the country and sectors the unified scientific and technical policy is being implemented mainly by the drafting of the five-year and annual plans of the development of science and technology as a component of the State Plan of USSR Economic and Social Development and the corresponding sectorial plans, in the regions there is no such effective tool of its implementation. Therefore the implementation of the unified state scientific and technical policy at all levels will be effective in case of the combination of the influences of sectorial and territorial organs on this process.

A large number of major problems of an economic, social, scientific, technical and ecological nature, the solution of which by the efforts of sectorial organs of management alone will be incomplete and ineffective, have now appeared. Here are just three examples of a purely sectorial approach to the solution of problems of this sort.

More than half a century ago specialists of the USSR Academy of Sciences established the need for the complete industrial utilization of the apatite-nepheline ores of the Kola deposit. But whereas the apatites are being used for processing, the other, and larger portion of this most value raw material (more than 80 percent) for the production of alumina is going to the dumps. In order to avoid this, in 1967 it was decided to construct several cement and alumina plants at the base of the Kola deposit. However, departmental isolation and the purely sectorial approach on the part of several ministries hindered the fulfillment of the decision. This is turning into an annual loss of 1 million tons of alumina, 1 million tons of soda products and 10 million tons of Portland cement. At the same time the spending of foreign currency

for the purchase abroad of bauxites and caustic soda is continuing, while the Apatit Association is spending considerable capital on the storing of nephelinic waste products and is polluting the environment [2].

Or take the problem of the production of molybdenum fertilizers, even an insignificant portion of which is capable of sharply increasing the yield. It is possible to obtain these fertilizers from the production waste of the electric light bulb industry. Patents for the appropriate technology were purchased by a number of capitalist states back in 1961. In our country only the Riga Electric Light Bulb Plant produces such fertilizers, while the enterprises of the Ministry of the Electrical Equipment Industry can deliver for the production of micromolybdenum fertilizers 150 tons of secondary molybdenum. However, the narrow departmental approach is having the result that to this day the "miracle top dressing" finds itself in the pits for industrial waste products [3].

The waste products of enterprises, which process mineral raw materials (the "tailings" of concentrating mills, the cinder and ash of metallurgical plants and thermal electric power plants), in turn are valuable secondary raw materials, from which it is possible to obtain products of 40 descriptions. In case of the proper development of local initiative and enterprise on this basis it would be possible to set up low-waste or even waste-free production [4].

All three problems names above can be successfully solved with the active participation of territorial organs. However, the latter do not have the appropriate rights and means for this. For scientific and technical progress is the objective basis for the solution of such intersectorial problems of the development of territories, and, consequently, it should also become an object of regional management, and not only sectorial management; otherwise it will hardly be possible to solve the indicated problems.

Of the two aspects of the management of scientific and technical progress only one--the sectorial--has been formed. It is also necessary to form the second--the territorial aspect, since without this it will simply be impossible to ensure the fulfillment of the decisions of the 26th party congress in the area of the more complete combination of sectorial and territorial management.

The need for the territorial management of scientific and technical progress also stems from the necessity of the decrease of the existing significant differences in the organizational and technical level of individual sectors of industry and the national economy as a whole, which adversely affect the balance of their economic and social development on the scale of the region. This is clearly seen from the data of Table 1.

The sectorial system of the management of scientific and technical progress, although ensuring increasing volumes of the introduction of scientific and technical achievements in production, all the same, figuratively speaking, "is spinning wheels." First, the decrease of the rate of the annual increase of the indicators of scientific and technical progress in the national economy of the country during 1976-1982 as compared with the 9th Five-Year Plan by a

factor of 1.5 to 3 and, second, the nonfulfillment of the five-year plan assignments of the introduction of new equipment for the country as a whole attest to this. In this connection it is necessary along with the implementation of the measures of sectorial influence on the acceleration of scientific and technical progress, which are envisaged in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy," to supplement them with the formation of a system of the territorial management of scientific and technical progress.

Table 1

Some Comparable Indicators of the Organizational and Technical Level of Several Sectors of Industry and the National Economy of Donetsk Oblast (according to the data for 1983)

Sectors of industry and national economy	Comparable indicators of organizational and technical level			
	1	2	3	4
Industry as a whole	450	41.0	17.0	805
Including:				
ferrous metallurgy	670	44.0	37.2	977
machine building and metalworking	560	45.1	10.5	846
coal	365	32.2	7.6	611
food	190	38.8	17.3	411
light	170	61.9	23.3	381
timber and wood processing	310	49.1	34.5	151
milling, groats and mixed fodder	185	18.9	8.1	122
Trade	14	14.5	27.5	98
Public dining	8	19.6	22.3	75
Consumer services	46	23.9	55.3	57

Key:

1. Expenditures on scientific and technical progress per worker a year, rubles
2. Proportion of those engaged in mechanized and automated labor in the total number of workers, percent
3. Proportion of those working on the basis of brigade forms of the organization of labor in the total number, percent
4. Technical equipment of engineering and managerial labor, rubles/person

The overcoming of the contradiction, which is becoming stronger and stronger, between the territorial sectorial nature of the management of academic science and the purely sectorial nature of the management of applied science and the introduction of its achievements in social production, which leads to a break in the chain "basic research--applied research--experimental design and technological developments--introduction," is possible by bringing these systems in line, that is, by the formation of the territorial aspect in the management of the development of sectorial science and technology.

Considerably greater efficiency, the specificity of the control of the implementation by associations and enterprises of plans of scientific and technical progress and the possibility of its accomplishment directly at the local level are characteristic of local organs. The same thing also applies to the making of decisions in accordance with the results of control.

The need for the supplementing of the existing sectorial system of the management of scientific and technical progress with a territorial system is convincingly confirmed by the development of studies of the regional aspects of the management of scientific and technical progress in our country and in other socialist countries and by the introduction of their results in the activity of local organs. First of all one should note the elaboration and the experience of the formulation of regional comprehensive programs of scientific and technical progress for the Ukrainian SSR (for 1986-2005), the Donbass (for 1981-2000), for Moscow, Leningrad and Leningrad Oblast, for the Belorussian SSR (for 1986-2005) and other union republics. The program "The Most Important Scientific and Technical Problems of the Development of Productive Forces for the Period 1981-1990" has been formulated and is being implemented in Krasnoyarsk Kray, a plan of the renovation and retooling of operating production has been draft and is being implemented--for the second five-year plan in a row--in Sverdlovsk Oblast, plans of scientific and technical progress have been drafted and are being implemented in Voroshilovgrad, Donetsk, Leningrad and Kharkov oblasts. In the Lithuanian SSR for the purpose of the combined settlement of questions of scientific and technical progress the republic Academy of Sciences jointly with ministries and departments in 1972 drew up proposals and forecasts with respect to the most important scientific and technical problems of the development of the national economy for the future to 1990. It would also be possible to cite other examples. They all clearly attest to one thing--the necessity and possibility on the part of local organs to influence the acceleration of scientific and technical progress in their regions.

Scientific and technical programs of regions will be elaborated and implemented during the 12th Five-Year Plan in conformity with the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy."[1]

The objective needs for the increase of the influence of local organs of management on the acceleration of scientific and technical progress led to the formation and subsequent development of individual forms of the regional management of scientific and technical progress. The scientific centers and affiliates of the USSR Academy of Sciences or the academy of sciences of the union republic, scientific coordinating councils in the regions, where there are no scientific centers or affiliates, councils for the promotion of scientific and technical progress attached to local party organs, commissions of the executive committees of the local soviets of people's deputies for questions of scientific and technical progress, councils of rectors of higher educational institutions, intersectorial scientific production complexes and educational scientific production associations are among the public forms of such influence. The state economic aspect of the regional management of scientific and technical progress is also undergoing development: departments

of the statistics of new equipment of oblast statistical administrations, territorial centers of standardization and metrology, scientific and technical information and propaganda, departments of technical progress of oblast planning commissions (for example, in the Ukrainian SSR) have been set up and are in operation.

All these organizational forms of influence on the acceleration of scientific and technical progress in regions attest to an atmosphere of searching and to a creative approach to the solution of the problems of the management of scientific and technical progress. At the same time one should regard as the basic shortcomings of the established forms of the management of scientific and technical progress in regions their undeveloped state, unfinished nature and incompleteness.

In a number of socialist countries (the GDR, Hungary, Mongolia, Romania) significant experience of the influence of local organs on the acceleration of scientific and technical progress has been gained, especially in the GDR. The inclusion in the plans of territorial development of sections on the introduction of scientific and technical achievements, the direct participation of local organs in the accomplishment of the plan assignments on such introduction, the formation of stable regional relations between enterprises of the same region in the area of the acceleration of scientific and technical progress and the coordination of the activity of local organs with sectorial organs in the area of the solution of scientific and technical problems are the basic directions of such influence.

The performed research and the gained experience show that the development of the regional aspect in the management of scientific and technical progress should be accomplished on the basis of the formation in regions (autonomous republics, krays, oblasts) of a mechanism of the territorial management of scientific and technical progress. This will make it possible to accomplish simultaneously two important practical tasks: first, to create the bases for the purposeful influence of local organs on the acceleration of scientific and technical progress and, second, to form the base for the assurance of the combination of the sectorial and territorial management of the development of science and technology.

It is necessary to form the mechanism of the management of scientific and technical progress in regions on the basis of the requirements of the systems approach. Such a mechanism should at least include: a "tree" of goals and the tasks, the organizational structure; the principles, methods and functions of management; the basic tools of influence of local organs on the acceleration of scientific and technical progress; the appropriate personnel, equipment and technology of management; a set of criteria of the evaluation of the efficiency of the management of scientific and technical progress in regions.

Let us examine the individual components of the mechanism of the management of scientific and technical progress in a region. It is advisable to carry out gradually, in three stages, the formation of the organizational structure of the system of the territorial management of scientific and technical progress (STU NTP). At the first of them one should create the organizational

structure, which is based primarily on the elements of social influence on the acceleration of scientific and technical progress, with the inclusion in it of the organs of state economic management of scientific and technical progress, which exist in the regions. In this case the organizational elements indicated above will be included in the structure.

At the second stage the conducting of an organizational economic experiment on the formation of organs of state management of scientific and technical progress (the scientific and technical administration of the council of ministers of the autonomous republic, the kray and oblast soviet executive committees and the department of scientific and technical progress within the state planning committee of the autonomous republic, the kray and oblast planning commissions)[2] in the regions which have for this the appropriate experience and a scientific research base: in Moscow, Kiev, Leningrad, in Leningrad, Voroshilovgrad, Dnepropetrovsk, Donetsk, Lvov, Sverdlovsk and Kharkov oblasts and in Krasnodar Kray, is expedient.

And, finally, at the third stage in accordance with the results of the conducting of the experiment it is necessary to set up in all ASSR's, krays and oblasts scientific and technical administrations under the supervision of one of the deputy chairmen of the council of ministers of the corresponding republic, kray and oblast soviet executive committees and departments of scientific and technical progress within the regional planning commissions. It is possible to carry out the establishment of such organs of state influence within the limits of the existing staffs and allocations by their corresponding redistribution. In this case the scientific and technical administration will be in charge of the subsystem of the state economic management of scientific and technical progress in the region. The most important principle of the operation of such an organ should be the assignment to its competence of questions of the acceleration of scientific and technical progress at all associations, enterprises and organizations of the given region regardless of their department subordination.

All the presently operating organs of state economic management, which were indicated above, will be a part of this subsystem. As a result of the implementation of the third stage the system of the territorial management of scientific and technical progress will consist of two subsystems, which closely interact: the subsystem of state economic management and the subsystem of public management (see the diagram).

The following functions are included in the structure of the process of managing scientific and technical progress in a region: programming (including forecasting), planning, control (including accounting and analysis), organization, regulation, stimulation. The basic tools of the territorial management of scientific and technical progress, such as the regional comprehensive program of scientific and technical progress (RKP NTP) or the section "Regional Problems of Scientific and Technical Progress" of the union or republic program of scientific and technical progress for a 20-year period, regional scientific and technical programs (RNTP's), the five-year and annual territorial plans of scientific and technical progress, are formed and used by means of these functions.

Key:

1. Subsystem of state economic management of scientific and technical progress in the oblast (ASSR, kray)
2. System of territorial management of scientific and technical progress
3. Subsystem of public management of scientific and technical progress in the oblast (ASSR, kray).
4. Complex of the Automated System of Management of Scientific and Technical Progress--the oblast (ASSR, kray).
5. Scientific and technical administration of the oblast soviet executive committee (council of ministers of the ASSR, kray soviet executive committee)
6. Council of the promotion of scientific and technical progress attached to the oblast (kray) party committee
7. Territorial scientific center (affiliate, scientific coordinating council)
8. Department of scientific and technical progress of the oblast planning commission
9. Department of new equipment of the oblast statistical administration
10. Territorial center of scientific and technical information
11. Territorial center of standardization and metrology
12. Department for the study of regional problems of the management of scientific and technical progress, of the territorial scientific center, affiliate (the regional working scientific methods group of the scientific coordinating council)
13. Intersectorial scientific production complexes
14. Interdepartmental special-purpose scientific production associations
15. Educational scientific production associations
16. Territorial council of rectors of higher educational institutions
17. Commissions of city rayon soviet executive committees for questions of scientific and technical progress
18. Commission of the oblast soviet executive committee (council of ministers of the ASSR, kray soviet executive committee) for questions of scientific and technical progress
19. Commission for the promotion of scientific and technical progress attached to the sectorial departments of the oblast (kray) party committee
20. Councils for the promotion of scientific and technical progress attached to the city (rayon) party committees
21. Associations, enterprises, organizations, scientific institutions, higher educational institutions

The elaboration and implementation of regional comprehensive programs of scientific and technical progress and regional scientific and technical programs make it possible to fully implement in the regional management of scientific and technical progress the goal program approach.

The regional comprehensive program of scientific and technical progress (or the corresponding section of the union or republic program of scientific and technical progress) is the basic preplanning document of a forecasting and analytical nature. This stems from the fact that all the identified scientific and technical problems of a regional scale and nature are included in it. Moreover, in the structure of the program one should envisage a

section of priority measures: those included either in the plan of scientific and technical progress or in the national scientific and technical programs, and through them in the plan of the economic and social development of the region for the forthcoming five-year plan. This will make it possible to ensure the close interconnection of all the basic tools of the regional management of scientific and technical progress and to implement effective control over the implementation of the regional comprehensive program of scientific and technical progress (the section).

The regional scientific and technical programs as a directive document should become a component of the five-year territorial plan of scientific and technical progress by the inclusion of their assignments and results in the corresponding sections of this plan. Such an approach will also lend to a certain degree a preplanning nature to the regional scientific and technical programs.

The autonomous republic, kray, oblast, their aggregate and the large city can be a sphere of effect of the regional comprehensive program of scientific and technical progress (the section). Such a program in its aggregate is a scientific organizational preplanning document of a forecasting and analytical nature and of general orienting importance, which includes forecasts of the basic directions of scientific and technical progress and its socioeconomic consequences. It is advisable to formulate the regional comprehensive program of scientific and technical progress with allowance made for a number of methodological requirements: its compatibility with the regional or union comprehensive program of scientific and technical progress; its content as the aggregate of forecasts of the scientific and technical and, on this basis, the socioeconomic development of the given region; the continuity of elaboration; the simultaneousness in time of formulation with the republic and union comprehensive programs of scientific and technical progress; the iterative nature of elaboration with respect to the republic and union comprehensive programs of scientific and technical progress.

It is possible to regard a period of 20 years with a breakdown by five-year plans as the optimum term, for which the effect of the regional comprehensive program of scientific and technical program should be designed and which would promote the assurance of its compatibility with the republic and union comprehensive programs of scientific and technical progress. Every 5 years it is liable to modification and specification and the term of its effect is extended for the next 5 years.

The predicted values of the indicators of scientific, technical, socioeconomic and ecological development should have a maximum, mean and minimum value (except for the indicators of the forthcoming five-year plan). The approximate structure of the regional comprehensive program of scientific and technical progress can be the following: 1) the scientific and technical orientation of the national economic complex of the region (the consolidated section); 2) the development and distribution of the scientific and technical potential; 3) the basic directions of scientific and technical progress in the sectors of the national economy; 4) the regional intersectorial problems of scientific and technical progress; 5) the socioeconomic consequences of

scientific and technical progress in the region; 6) the priority measures which are included in the plan of the forthcoming five-year plan.

For the formulation of the regional comprehensive program of scientific and technical progress it is also necessary to specify the "tree" of goals of the program, the system of indicators of scientific and technical development and its socioeconomic consequences, the composition of the directions of scientific and technical progress, the initial data, the possible sources of resource supply, the degree of sectorial and territorial differentiation of the program and the procedure of its formation.

The formulation of the regional comprehensive program of scientific and technical progress should be carried out under the scientific organizational supervision of the scientific center (affiliate, scientific coordinating council) and the regional planning commission.

The regional scientific and technical programs are formulated for the purpose of solving important problems which are connected with the implementation of the unified state scientific and technical policy in a specific region. They are called upon to reveal specific contradictions and to contribute to their surmounting between the ever increasing needs of the scientific and technical development of the national economy of the given region and the available means of their satisfaction.

The regional scientific and technical program is a directive document, in which the set of scientific, technical, production, organizational and economic goals and measures, which are aimed at the solution of a specific major regional scientific and technical problem, is coordinated with respect to time, performers and resources. For the choice of such goals and measures it is advisable to use the following criteria: the intersectorial and interdepartmental nature of the corresponding problem; the particular scientific, technical, economic, social or ecological urgency of its solution; the great regional or national economic efficiency, which its solution promises, its significant influence on the economic and social development of the region, the republic or the country as a whole; the need for the solution of the problem in a limited time; the impossibility of its effective solution within the plan of scientific and technical progress or the plan of the economic and social development of the region; the limitedness of the number of programs which are being formulated and implemented simultaneously.

With respect to the structure of the regional scientific and technical program at least 13 different versions, which contain 92 elements, are cited in the literature. The analysis of these versions, as well as our own research give grounds to propose the following model structure of the regional scientific and technical program: the established level of the problem which is being solved in accordance with the program; the "tree" of goals of the program; a set of measures; resource supply; the composition of performers; the date of the implementation of the program (by stages, measures and assignments); the environment, the location of introduction; the sequence of the formulation and implementation of the program; the organizational structure of the management of the program. The specific content of each of the sections of the program is

determined by the characteristic features of the regional scientific and technical problem which is being solved in accordance with the program.

The choice of the sequence of the formulation and implementation of the program is determined entirely by its structure, since the set of stages of the formulation and implementation of the program should encompass the formulation of all the sections of the regional scientific and technical program. With allowance made for this provision the following stages can be the standard ones for regional scientific and technical programs: the choice of the problems, which are being solved in accordance with the program, the preparation of the initial assignment for the formulation of the program, the formation of the "tree" of goals of the program, the formulation of its alternate versions, the evaluation and choice of the optimum version, the drawing up of the program in the form of a separate document, the management of the program (with allowance made for the inclusion of its assignments in the plan).

Some experience in the management of regional scientific and technical programs has already been formed. One of its versions consists in the setting up and functioning of interdepartmental special-purpose scientific production associations and complexes, through which the management of specific regional scientific and technical programs is also carried out. In case of another version the management of the program is carried out through a coordinating council headed by the secretary of the oblast party committee or a deputy chairman of the oblast soviet executive committee.

Another means, for which the appropriate prerequisites exist, is also possible: the influencing of the programs by their support on the part of territorial centers of scientific and technical information and the making of control information on the progress of their implementation available to local organs of management. The choice of one version or another of the organizational structure of the management of the program will depend in many ways on the nature of the regional scientific and technical program, the formed conditions of its implementation and the traditional forms of the management of scientific and technical progress in one region or another.

When formulating and managing the regional scientific and technical program it should also be taken into account that they can be of two types: programs which are a fundamental part of republic or union scientific and technical goal programs;[3] programs of a purely regional nature.

Planning constitutes the basis of the management of the economy, including such a most important factor, which determines its development, as scientific and technical progress. In conformity with the USSR Constitution the local soviets of people's deputies manage the economy of their region on the basis of the plan of economic and social development, which is drawn up with respect to the entire set of associations, enterprises and organizations regardless of their departmental subordination. In this connection the territorial plan of scientific and technical progress should also be a leading section of the five-year plan of the economic and social development of the region.

During the drafting of the plan of scientific and technical progress it is advisable to specify the initial data, the sources of financing, the degree of sectorial and intraregional differentiation, the set of indicators, the composition of the directions of scientific and technical progress, which are common for all the sectors of the national economy of the given region, and its economic, social and ecological results.

The experience of drafting such plans and the conducted research make it possible to propose the following model structure of the territorial plan of scientific and technical progress: 1) the conducting of basic research on the natural, technical and social sciences; 2) the solution of the basic scientific and technical problems of an applied nature; 3) the development and distribution of the scientific and technical potential; 4) the most important measures which are being introduced in the national economy; 5) the basic indicators of scientific and technical progress in the national economy of the region; 6) the basis results of the introduction of measures in accordance with the plan; 7) the basic indicators of the economic and social development of the region, in which the results of scientific and technical progress are reflected.

It is necessary to carry out the drafting of the five-year territorial plan of scientific and technical progress on the basis of the observance of the methodological requirements of completeness, continuity, the orientation of the plans of scientific and technical progress toward the assurance of the planned rate of economic and social development, iterativeness (the consistent combination in the unified plan of scientific and technical progress of sectorial and regional interests and the possibilities of the acceleration of scientific and technical progress).

The establishment in the structure of the regional planning commission of a department of scientific and technical progress will make it possible to assign to it the tasks on the drawing up of the territorial plan of scientific and technical progress with the enlistment for this of the scientific centers (affiliates, scientific coordinating councils), associations, enterprises and organizations of the given region.

The realization of the requirements of iterativeness dictates the need for the formulation and consolidation in the economic legal respect of the procedure of submitting the territorial plan of scientific and technical progress for approval to sectorial organs. Such a procedure should first of all envisage the drafting of the plan of scientific and technical progress at the same time as the drawing up of the plan of the economic and social development of the region.

In conformity with the indicated methodological approaches plans of scientific and technical progress in industry and other sectors were drafted and implemented in Donetsk Oblast (the 10th and 11th Five-Year Plans) and Voroshilovgrad Oblast (the 11th Five-Year Plan). Their fulfillment showed the great effectiveness of the territorial planning of scientific and technical progress in addition to sectorial planning (see Table 2).

Table 2

The Effectiveness of the Introduction of Measures in Accordance With the Five-Year Plans of Scientific and Technical Progress in Industry of Voroshilovgrad and Donetsk Oblasts in 1981-1983

Oblast	1			2		
	plan	report	plus or minus	plan	report	plus or minus
Voroshilovgrad	16.1	12.4	-3.7	8.7	8.1	-0.6
Donetsk	13.6	13.3	-0.3	5.7	6.4	+0.7
	3			4		
Voroshilovgrad	0.54	0.66	+0.12	1.85	1.52	-0.33
Donetsk	0.42	0.48	+0.06	2.39	2.07	-0.32

Key:
1. Amount of expenditures per measure, thousands of rubles
2. Impact per measure, thousands of rubles
3. Effectiveness of expenditures on implementation of scientific and technical measures, rubles/ruble
4. Payback period, years

It is advisable to carry out the organization of control and analysis as functions of the regional management of scientific and technical progress on the basis of the system of reporting on scientific and technical progress and regional statistical administrations, which are in operation in the country. Research shows that the control and analytical information on the progress of the fulfillment of the territorial plan of scientific and technical progress and regional scientific and technical programs should meet a number of methodological requirements: efficiency, specificity, an addressed nature, the conformity of the number of controlled indicators to the promptness of the obtaining of information, the conformity of the system of controlled directions and indicators of scientific and technical progress to the system of planned directions and indicators.

For the specific implementation of these requirements it is necessary to solve a large number of problems. It is possible to group with them the increase of the promptness of the submitting of form 10-NT "Report on the Expenditures on Measures on New Equipment and Economic Effectiveness,"[4] the enlargement of the composition of the directions of scientific and technical progress, which are monitored in the statistical reporting on new equipment; the bringing of the set of controlled indicators on scientific and technical progress into complete conformity with the set of planned indicators and a number of others.

In the process of the regional management of scientific and technical progress it is necessary to observe the same principles as in the management of the national economy as a whole, with allowance made, of course, for a certain specificity of their application on a regional scale and the peculiarities of

scientific and technical progress as an object of management. As to the methods of the management of scientific and technical progress in regions, they are approximately the same as in national economic management. However, here there is an essential peculiarity: at present in the regional management of scientific and technical progress primarily organizational and political and to a certain degree sociopsychological methods and, to a significantly smaller extent, economic methods are used and legal methods of management are absent. The poor development and use of economic methods in the regional management of scientific and technical progress are the basic argument among a certain portion of the economic scholars, who deny the necessity and possibility of such a type of management. But here for some reason it is forgotten that among the economic methods, in additional to cost accounting, economic stimulation and financing, there are also planning, the extension of credit and economic analysis, which are already being used in regions for influencing the acceleration of scientific and technical progress. The economic methods of the first group, indeed, still have to be elaborated, although in this regard the corresponding proposals already exist in the literature.

It is necessary to periodically evaluate the progress of the formation and subsequent development of the system of the territorial management of scientific and technical progress in any region from a qualitative and quantitative point of view. It is possible to make a qualitative evaluation by means of the following criteria: the completeness of the inclusion in the system of the territorial management of scientific and technical progress of the cited elements of the organizational structure and the tools of influence of regional organs on the acceleration of scientific and technical progress; the degree of the combination of the sectorial and territorial aspects in the management of scientific and technical progress on the regional scale; the comparability of the territorial plan of scientific and technical progress with the plan of the development of science and technology of the union republic, with the plans of the technical development and organization of production (service) of associations and enterprises, the plans of scientific research work of scientific research institutes and higher educational institutions, with the corresponding statistical reporting on scientific and technical progress; the degree of use in the territorial plan of scientific and technical progress, the regional comprehensive program of scientific and technical progress and the regional scientific and technical program of the regional factors of scientific and technical development; the degree of the reflection of the results of scientific and technical progress in the plan of the economic and social development of the region; the degree of the implementation of control on the part of party and soviet organs of scientific centers (affiliates, scientific coordinating councils) over the implementation of the plan of scientific and technical progress and the programs.

It is also advisable to use the set of cited criteria when analyzing the system of the management of scientific and technical progress in one region or another, which is to undergo development. The comparison of the set of indicated criteria of the evaluation of the existing and planned systems of the management of scientific and technical progress will show the qualitative aspect of the latter.

It is possible to made a quantitative evaluation of the efficiency of the formation, development and functioning of the system of the territorial management of scientific and technical progress by the checking and analysis of the effectiveness of the implementation of the plan of scientific and technical progress and the regional scientific and technical programs (the comparison of the planning and reporting data for a specific period). Moreover, it is expedient to determine the influence of the results of scientific and technical progress on the value of the basic indicators of the plan of the economic and social development of the region (according to the plan and actually).

Such a comprehensive, qualitative and quantitative evaluation of the efficiency of the system of the regional management of scientific and technical progress will make it possible to determine more precisely the "bottlenecks" in it and to develop and improve purposefully the systems of the management of scientific and technical progress, which operate in regions.

The solutions proposed in this article of the basic methodological problems of the formation of the mechanism of the regional management of scientific and technical progress do not lay claim to an exhaustive elaboration of the corresponding concept in this area. Here it is necessary to solve some other major theoretical problems, and first of all to study the political economic aspect of the regional management of scientific and technical progress and the economic and legal methods of this type of management and to formulate the principles of the combination of the sectorial and territorial aspects in the management of the development of science and technology.

The theoretical novelty and complexity of the problem and the large amount of research, which it is necessary conduct, require the more precise and effective coordination of scientific forces within the Economics Department of the USSR Academy of Sciences with the enlistment of a number of institutes of the system of the USSR State Planning Committee and the state planning committees of the union republics. Definite steps have already been taken in this direction.

Taking into account the increasing importance of the elaboration of the problems of the regional management of scientific and technical progress, the Buro of the Economics Department of the USSR Academy of Sciences in 1982 examined the report of the Institute of Industrial Economics of the Ukrainian SSR Academy of Sciences "The Study of the Regional Aspects of the Management of Scientific and Technical Progress in the Ukrainian SSR" and endorsed its basic assumptions. By this decision the Section of Economics of Regional Problems of Scientific and Technical Progress of the Scientific Council of the USSR Academy of Sciences for Economic Problems of the Scientific and Technical Revolution was transformed into the Problem Commission of the Territorial Management of Scientific and Technical Progress, which has begun to operate significantly more actively.

In November 1983 the All-Union Applied Science Conference "The Problems of the Management of Scientific and Technical Progress in Regions in Light of the Decisions of the 26th CPSU Congress (Theory, Experience, Prospects)" was held in Donetsk. In the Ukrainian SSR the Coordinating Plan of Research on

Problems of the Territorial Management of Scientific and Technical Progress has been formulated for 1981-1985 and is being implemented (the main organization is the Institute of Industrial Economics of the Ukrainian SSR Academy of Sciences).

However, these measures are insufficient. The formulation and implementation during the 12th Five-Year Plan of the corresponding scientific organizational goal program under the supervision of the Economics Department of the USSR Academy of Sciences are required. Its implementation will make it possible to complete the formulation of the concept of the regional management of scientific and technical progress in addition to the existing sectorial concept.

FOOTNOTES

1. During the 11th Five-Year Plan more than 120 regional scientific and technical programs have been formulated and are being implemented in the oblasts of the Ukrainian SSR.

2. Within the Donetsk Oblast Planning Commission the Department of Scientific and Technical Progress has been operating since 1980, while in 1984 in all the oblasts of the Ukrainian SSR departments of manpower resources and scientific and technical progress were formed in the structure of the oblast planning commissions.

3. For example, in the Ukraine the republic program "Labor," which is differentiated by oblasts, is such a program.

4. For example, the Ukrainian SSR Central Statistical Administration checks quarterly such results of the introduction of new equipment as the decrease of the product cost and the relative reduction of the number of workers.

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SOCIALIST COMPETITION OF SCIENTIFIC COLLECTIVES

Moscow NAUCHNYY KOMMUNIZM in Russian No 2, Mar-Apr 84 pp 152-154

[Review by Doctor of Philosophical Sciences Professor Ye. A. Anufriyev, Honored Figure of Science of the RSFSR, and Candidate of Philosophical Sciences V. I. Speranskiy of book "Problemy sotsialisticheskogo sorevnovaniya nauchnykh kollektivov" [Problems of the Socialist Competition of Scientific Collectives], edited by R. G. Yanovskiy, Vysshaya shkola, Moscow, 1982, 271 pages]

[Text] Under the conditions of mature socialism the role of socialist competition in the system of social relations is great as never before. Relying on the achievements of scientific and technical progress, competition promotes the intensification of social production, the improvement of management and the improvement of the economic mechanism. It effectively influences the increase of the education and skill of workers, accelerates the increase of labor productivity, promotes the efficient use of available equipment and the rapid introduction of new, more advanced equipment and contributes to the increase of product quality and the exceeding of the production plans. The social impact of competition is constantly growing, its educational significance is increasing.

Socialist competition arises and develops not only in production, but also in the nonproduction sphere. Competition has taken on an extensive scale among scientists and engineering and technical personnel of academic institutions, scientific research and planning and design organizations, higher and secondary specialized educational institutions. Competition of our times is an important factor of the increase of the creative activity of the scientific, engineering and technical intelligentsia and the increase of its contribution to the common cause of the building of communism.

Stable forms of competition in the sphere of science have formed in our country. However, in the literature this experience for the present has not yet been generalized, the new valuable initiatives, which are aimed at the development of the creative cooperation of scientists and engineering and technical personnel with the collectives of industrial enterprises and agricultural associations, frequently remain outside the field of view of researchers. Whereas tens of monographs and candidate and doctoral dissertations are devoted to the general problems of competition and to

competition in the production sphere, there are few works on socialist competition in labor collectives. It is possible to indicate the book of G. A. Lakhtin "Sotsialisticheskoye sorevnovaniye v nauchnykh uchrezhdeniyakh" [Socialist Competition at Scientific Institutions] (1975), individual publications in the periodic press and two or three books, which generalize local experience (see, for example, V. A. Konoplev, O. V. Timoshenko, V. A. Shabashev, "Sorevnovaniye v vuzakh Kuzbassa: Opyt, problemy" [Competition at the Higher Educational Institutions of the Kuzbass: Experience, Problems], Kemerovo, 1981; A. S. Mikhnevich, G. S. Shapiro, "Sotssorevnovaniye kak faktor povysheniya effektivnosti NIR: Opyt Instituta mekhaniki metallopolimernykh sistem AN BSSR" [Socialist Competition as a Factor of the Increase of the Efficiency of Scientific Research Work: The Experience of the Institute of Mechanics of Metal Polymers Systems of the Belorussian SSR Academy of Sciences], Minsk, 1980; S. A. Nekrashevich, "Sotsialisticheskoye sorevnovaniye v nauchnykh uchrezhdeniyakh Belorusskoy SSR" [Socialist Competition at Scientific Institutions of the Belorussian SSR], Moscow, 1979).

In the book under review the basic aspects of competition in the sphere of science are examined in combination. Scientists, party, trade union, economic and soviet executives and representatives of scientific and technical societies are the authors of the book. The experience of the organization of the competition of scientific collectives for the acceleration of scientific and technical progress and for the efficiency of scientific activity with allowance made for the possibilities of the scientific and technical revolution and the full use of the advantages of mature socialism is generalized in it. In the book it is shown that the competition of scientific collectives is oriented today toward the early accomplishment of the plan assignments of the 11th Five-Year Plan, the implementation of comprehensive scientific and technical programs, the introduction in the national economy of the achievements of science and technology, the increase of the technical level of production and the saving of all types of resources, the implementation of the USSR Food Program. And although in the introduction the authors stress that they do not aspire to the complete coverage of all the problems, which are connected with the organization of the competition of scientific collectives, in the monograph practically all the basic questions of the development and improvement of the competition of scientists and engineering and technical personnel are examined.

In the first section of the monograph "Socialism and Socialist Competition in Science" the essence of socialist competition at scientific institutions is examined, the role of the trade union organization and scientific and technical societies in the competition of scientists is revealed. The authors devote special attention to the analysis of those forms of competition, which are directly aimed at the acceleration of scientific and technical progress.

Under today's conditions the competition of scientists has become an integral trait of their socialist way of life. All types of competition, especially its highest form--the movement for a communist attitude toward labor, are aimed at the education of the scientist as a citizen of socialist society and at the development in him of the need to work to the full extent of his mental and physical powers. During the 11th Five-Year Plan socialist competition at scientific research, planning and design organizations of the country is

gaining strength and new acceleration, its participants are striving for the increase of the efficiency and the intensification of production, the acceleration of scientific and technical progress, the saving of manpower and material resources and the increase of product quality. At the same time in the socialist competition of scientists there are also unsolved problems. In the book the basic ones of them are analyzed: those groups of scientists, which are engaged in research work, are being involved slowly in competition; competition by individual specialties has still been poorly developed and organized, there is no individualized approach to the competitors according to skills categories, the criteria of the evaluation of the labor of scientists and engineers have not been specified clearly enough, the moral and material stimuli in the sphere of scientific activity are still being poorly linked with the results of socialist competition. The authors of the monograph generalized the available experience in the solution of these problems.

The introduction of the achievements of science in production is one of the most urgent and most important problems of management. Both industrial enterprises and scientific research and planning and design organizations are interested in its effective solution. At the same time, as the authors of the monograph note, the very term "introduction" bears a stimulating, as if compulsory basis. There are still quite a few cases when enterprises do not have the reserves of production capacities, which are necessary for this, very intense plans of the production of output are established for them. While the developments proposed for introduction at times prove to be "crude," it is necessary to "refine" them for a long time and agonizingly under the conditions of operating production. In the book it is convincingly demonstrated that the genuine cooperation of scientists and production workers in the solution of the problems of scientific and technical progress should succeed "forcible" introduction. The authors analyze the experience of the Ukrainian SSR, where such a promising form of the connection of science and production as contracts on cooperation, of which the joint comprehensive plans of scientific, technical and socioeconomic work of the Ukrainian SSR Academy of Sciences with enterprises, organizations and higher educational institutions of the oblasts of the republic form the basis, has been used for many years now (see p 22).

For the purpose of broadening and extending these relations the Ukrainian SSR Academy of Sciences has adopted the policy of the resolute increase of its own experimental base, where technical and technological innovations should undergo comprehensive checking so that their introduction would involve the minimum production risk. Now 8 plants, 27 pilot works, 27 design and technological bureaus and 6 computer centers are operating in the system of the republic Academy of Sciences. The total volume of output of pilot production comes to 170 million rubles a year. "It is indisputable that the leading growth rate of the pilot production base," the authors stress, "is a progressive phenomenon, which realizes the objective law of the scientific and technical revolution--the increasing industrialization of science."

In the second section of the monograph the functional peculiarities of the development of the socialist competition of scientific collectives are analyzed. Here the authors devote special attention to competition for the increase of the efficiency and quality of scientific work. The system, forms

and procedure of the organization of competition and the criteria of the summarizing of its results are different in each scientific collective. But "the fact that they are aimed at the improvement of the organizational forms of competition, the introduction of advanced know-how, the increase of the efficiency and the achievement of high qualitative results of scientific work and the successful fulfillment of the plan assignments," as is noted in the book, is common to them (p 68).

The goal program method of the planning of scientific and technical progress has become an effective means of increasing the quality and effectiveness of research and designing. The interconnection of competition and the goal program approach to the planning of scientific research work is regarded in the monograph as an important means of the intensification of scientific activity, which helps to take into account the integration processes which are developing in science and to cooperate scientific and production forces in the unified "idea-development-production" cycle.

The logic of the study of the functional peculiarities of competition leads the authors to the analysis of its educational role. "The educational function of competition in scientific collectives," it is noted in the monograph, "is manifested in the fact that it acts as a factor of the intensification of the creative activity of scientists, the formation of the personality of the scientist and the creation of a healthy sociopsychological climate in the collective" (p 86).

The third section of the book under review is devoted to the generalization of the advanced experience of the socialist competition of scientists. The practice of the best collectives is analyzed with a greater or smaller degree of detail in all the sections and paragraphs of the monograph, here the organization of competition for the successful fulfillment of the comprehensive scientific and technical programs and the forms of competition on the basis of contracts on creative cooperation are examined. Special attention is devoted to the organization of competition in a region, the experience of the competition of scientific collectives in the rayons of Moscow is examined. A separate place is devoted to competition at higher educational institutions and to its improvement.

What forms of competition will be most suited for the given specific conditions, how are the different types of socialist competition to be combined together? These questions never lose their topicality, for competition is a creative, constantly developing process. The authors, in generalizing the experience available in the USSR and other socialist countries, distinguish the most prevalent forms and types of socialist competition, which conform to the nature of the activity of scientific collectives (see p 143).

The attempt made by the authors to trace the basic stages of the organization of socialist competition: from the adoption of socialist obligations to the determination of the winners, the forms and means of the material and moral stimulation of the competitors, will arouse the unquestionable interest of the reader. In the monograph emphasis is placed on the need for the careful preparation of the socialist competition, selection, the multistage nature of

their passage, and at times the preliminary defense of the most important of them at the general meetings or in the commissions of the trade union committee, which have been specially set up for this purpose. All this helps to a significant extent to avoid formalism and to aim the collectives at the accomplishment of the main tasks--to make a significant contribution to the matter of social and economic progress.

The effectiveness of socialist competition is directly dependent on the choice of the criterion of the evaluation of its results. Only objective indicators, which make it possible to compare the results of the work of scientific collectives and to sum up adequately their contribution to the common cause, makes it possible to observe fully the Leninist principles of socialist competition: publicity, the comparability of the results, the possibility of the repetition of advanced experience. This is constantly stressed by the authors both in case of the theoretical study of the problems of competition and in case of the generalization of advanced experience. The fourth and final section of the monograph is specially devoted to the problems of the search for objective indicators and methods of their analysis. The indicators should be clear, precise and verifiable, for without this they are meaningless and cannot operate.

At present polar opinions are being expressed in the press with regard to the use of quantitative methods when analyzing the results of competition. The authors of the monograph do not enter the controversy: to determine or not to determine by means of quantitative indicators the winners of the socialist competition. They assert that the conditions exist today for the use of precise methods, only a scientific approach to their choice, lengthy experimental checking and, only after this, introduction in practice with allowance made for the specific conditions are required.

In this respect the experience of the Scientific Research Physical Chemistry Institute imeni L. Ya. Karpov is edifying. In 1968 a new system of the remuneration of labor was introduced here: the wage of the associate was made directly dependent on his creative activity, and not only on the held position and length of service. The new system of material stimulation was directly based on socialist competition, the results of which were correlated with the results of the periodic certification of scientists, during which their labor was evaluated first of all according to the specific results of research.

In 1971 the "Karpov" system also began to be used as an experiment at a number of other scientific research institutes of the country. The initiative of the institute was endorsed by the Moscow City Committee of the CPSU. Now this system is being used at more than 20 scientific institutions of the city. Experience showed, the authors write, that the "Karpov" system is very effective in the matter of increasing the efficiency of the work of scientific research organizations (see p 185).

The second paragraph of the last section of the book, in which the means of using the methods of the expert evaluation of the results of the activity of the competitors is revealed, will arouse much interest of experienced workers. The authors tell in detail about all the stages of the expert appraisal, cite

specific calculations and give examples of the use of the recommended methods of analysis.

The six appendices to the monograph, in which the conditions of the All-Union Socialist Competition of Scientific Collectives are cited and recommendations on the drafting and fulfillment by engineering and technical personnel and scientists of personal and collective creative plans are given, will be help for the organizers of socialist competition.

Not all of the parts of the book under review are written at an equally high level. In the first section the authors frequently shift to the declarative tone, using excessively the verbs "must," "should" and "is required." In the monograph there are repetitions, the same experience is discussed in different sections, at times an account is given of the obtained results, but not of the means of their achievement.

As a whole the book is undoubtedly a new important step in the theoretical analysis and generalization of the practical experience of the competition of scientific collectives. It has been greeted with interested by the readers and will give much assistance to managers, the party, trade union and Komsomol aktiv and to everyone, who is studying the problems of the organization of socialist competition, in the large amount of work on the implementation of the decree of the CPSU Central Committee "On the Improvement of the Organization, the Practice of the Summarizing of the Results of Socialist Competition and the Stimulation of Its Winners," which was adopted in September 1983.

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SCIENTIFIC, TECHNICAL PROGRESS, STRUCTURE OF SOCIAL PRODUCTION

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[Article by D. A. Chernikov (Moscow): "Scientific and Technical Progress and the Structural Changes in Social Production"]

[Text] The implementation of large-scale planning decisions is based on the allocation of vast material and manpower resources, the pursuit of an active structural policy and the determination of the most important directions of scientific and technical progress. Under these conditions the formulation of long-term national economic forecasts is necessary for the thorough substantiation of the assignments of the state plan. Among them the basic ones are: the demographic, ecological and social forecasts, the forecast of scientific and technical progress and the economic forecast.

The most significant interconnections between the indicated types of national economic forecasts reduce to the following. The process of forecasting concludes with the formulation of an economic forecast, in which the rates and proportions of expanded reproduction, the dynamics of manpower resources and employment, fixed capital and capital investments, the increase of the standard of living of the population, the development of foreign economic relations and foreign trade are estimated. The data of the demographic, ecological and social forecasts are the most important conditions and restrictions for the formulation of the economic forecast. The forecast of scientific and technical progress plays an active role in the system of national economic forecasting. This is connected with the fact that scientific and technical progress is the main means of accomplishing the long-range tasks on the meeting of the needs of the national economy and the population. The development of the energy and raw material base of the national economy, the improvement of the operating production system, the means and degree of the meeting of nonproduction needs depend precisely on the rate of scientific and technical progress over a long segment of time.

The interconnection between the forecast of scientific and technical progress and the economic forecast is realized on the basis of two approaches with a different direction. On the one hand, the urgent basic and applied research and the means of its effective accomplishment are established, the problems of introducing new means and objects of labor, as well as technological processes

in the production and nonproduction spheres are studied, the possible parameters of new equipment, the probable dates of introduction and the areas of its use are specified. On the other, the national economic demands on scientific and technical progress are established. They lie in the interval from the minimum permissible lower limit of the increase of resources of consumption to the socially motivated upper bound of their expansion. The minimum permissible increase occurs in case of the preservation of the established trends of the change of the conditions of the remuneration of labor and distribution from public consumption funds and the stabilization of the achieved volume of the placement of housing into operation. The maximum socially motivated increase of resources of consumption is based on the hypothesis of the need to achieve the indicators of a rational consumer budget within the given long-term period.

As a result of the interaction of the indicated approaches fundamentally new technical solutions, which are required for the assurance of the dynamically balanced development of the national economy in the future, are developed and the directions of progressive structural changes, which are in line with the policy of the intensification of social production, are determined.

The elaboration of the socioeconomic problems of scientific and technical progress presumes the improvement of the tools which are designed for the substantiation of the rates and proportions of expanded reproduction. The balance of the national economy acts as the basic means of establishing the rates and proportions of expanded reproduction when drafting the long-range plan. In the USSR State Planning Committee and at scientific research organizations much work has been done on the development of systems and methods of calculating this balance, which contributed to the improvement of five-year national economic planning and the extension of the analysis of the process of expanded reproduction. At the same time sufficiently reliable means of forecasting scientific and technical progress in the balance of the national economy for the long-range future so far have not been found. Whereas traditional open models like the intersectorial balance, of which a large amount of exogenously given information is characteristic, are used in the central set of tasks of the automated control system for planning calculations, which is designed for the drafting of five-year plans of economic and social development, a qualitatively new approach should be implemented in the integrated set of balance sheet calculations for the long-term period.

The construction of forecasting models of the rates and proportions of economic growth, which are the basis for the mentioned set, is complicated due to the lack of detailed technical and economic standards. Moreover, the standards themselves, which reflect the demands on scientific and technical progress, to a certain extent depend on the overall parameters of economic development and the state of balance of the national economy. These standards can differ significantly with respect to the level of expenditures of some types of limited production resources or others. Hence it follows that the technical and economic standards for the long-range future cannot be substantiated a priori. The interconnections between the most important parameters, which characterize the rates and proportions of expanded

reproduction, should be established within the system of models, on the basic of the study of the natural trends of the development of the national economy.

On the basis of the integrated set of balance sheet calculations for the long-range future the key problems of economic growth are established and the main directions of scientific and technical progress and structural changes in the national economy are outlined.

Under present conditions the intensification of social production is appearing as the fundamental basis of the economic development of the country. Frequently the factors, which are responsible for the need to change over to its primarily intensive means, are connected only with the increasing limitations on the means of extensive development. It seems to us that the inevitability of the changeover to a fundamentally new type of expanded reproduction is connected with the most important traits which are characteristic of the economy, which is at the stage of mature socialism, namely the achieved scale and level of proportionality of the production potential, the possibilities and requirements of the developing scientific and technical revolution, the increase of the orientation of the national economy toward the more and more complete and comprehensive meeting of the steadily increasing material and spiritual needs of the Soviet people. Along with these general laws of reproduction, which are characteristic of the stage of mature socialism, the urgency of intensification is increasing as a consequence of the narrowing of the extensive sources of the increase of manpower resources and the most important types of natural resources, which is occurring in the 1980's.

At the 26th CPSU Congress it was noted that "in its historical scale, importance and consequences the changeover of our national economy to the path of intensive development, which is being carried out, by right can be placed on the same level as such most profound changes as socialist industrialization, which radically changed the face of the country" ["Materialy XXVI s"yezda KPSS" [Materials of the 26th CPSU Congress], Moscow, Politizdat, 1981, p 107]. The consistent realization of the labor-, capital- and material-saving functions of scientific and technical progress is a characteristic trait of the intensive type of expanded reproduction.

The labor-saving function of scientific and technical progress was also realized systematically in case of the primarily extensive type of expanded reproduction. Under the conditions of the changeover to its primarily intensive type the consistent implementation of this function signifies its raising to the "upper limit," when the entire increase of the output being produced will be provided by means of the increase of labor productivity. Whereas in case of the primarily extensive type the capital- and material-saving functions of scientific and technical progress were realized sporadically and were of a local nature, their consistent embodiment appears as a distinctive feature of the primarily intensive type. The capital-saving function is called upon to ensure the steady preferential increase of the national income at first as compared with the dynamics of productive capital investments, and then with the dynamics of fixed production capital. The realization of the material-saving function of scientific and technical progress presumes the systematic decrease of the proportion of material

expenditures in the gross national product and the creation of the preconditions for the increase of the ultimate national economic results in case of nearly stable amounts of the most important types of natural resources, which are being committed to the economic turnover.

The macroanalysis of the process of economic growth shows that for the present the primarily extensive type of expanded reproduction is being carried out in our country. The share of its intensive type in the increase of the national income came to: in 1961-1965--34 percent; in 1966-1970--40 percent; in 1971-1975--27 percent; in 1976-1980--23 percent; in 1981-1982--25 percent.[1]

The changeover to its primarily intensive type, which constitutes the most important distinctive feature of current economic development, is impossible immediately. Taking into account the ripe need for the significant acceleration of the process of the replacement of fixed production capital, the significant coherence of capital investments at already started projects and the need for a profound shift in structural policy, such a changeover will be accomplished over a number of years. However, the policy of the intensification of social production should become more purposeful than before.

The improvement of the basic national economic proportions is required for this. Inherent in each type of expanded reproduction is its own system of proportions, which ensures the accomplishment of the economic goals which arise at one stage or another of economic development. An imbalance, which finds expression in the inadequate connection of the structure of the goals of economic growth and the composition of production resources, adversely affects the flow of the process of expanded reproduction, complicates the transition from the primarily extensive to the primarily intensive type of development and slows the pace of scientific and technical progress.

Under present conditions for the acceleration of the changeover to the path of primarily intensive development it is first of all necessary to ensure the coordination of the processes of the reproduction of fixed capital and manpower resources, the balance of capital construction and the overcoming of the limitations of fuel, energy and raw materials.

The forming ratio between the dynamics of fixed production capital and manpower resources is influencing significantly the overall pace of scientific and technical progress and the ratio between its main forms. As is known, the increase of labor productivity, which is the result of the interaction of its capital-consuming and capital-saving forms, acts as the most general manifestation of scientific and technical progress. The former is accompanied by the improvement of the use of living labor and the worsening of the use of the labor, which is embodied in fixed production capital, and involves the replacement of manual labor with mechanized labor. The capital-saving form of scientific and technical progress finds expression in the improvement of the use of both living labor and the labor embodied in fixed production capital and is realized in case of the replacement of operating means of labor with new, more efficient means.

With an increase of the growth rate of the capital-labor ratio a slowed down increase of the growth rate of labor productivity in case of the capital-consuming form of scientific and technical progress occurs. This is connected with the fact that the increase of fixed capital in this case not only is conducive to the increase of the production of output, but also offsets the relative replacement of living labor with embodied labor. The dynamics of capital-saving scientific and technical progress does not depend at all on the growth rate of the capital-labor ratio, but is predetermined by the intensity of the updating of the production equipment. Hence it follows that in case of the stable dynamics of the placement of fixed capital into operation with an increase of the growth rate of the capital-labor ratio, other things being equal, the share of the capital-consuming form of scientific and technical progress increases and the share of the capital-saving form decreases. The dependences between these forms and the factors influencing their dynamics, which were characteristic of the Soviet economy during 1961-1980, attest that under the conditions of the adopted policy of the intensification of social production for the achievement of the factor balance of the national economy it is necessary to decrease the definite gap between the growth rates of labor productivity and the capital-labor ratio. Rough estimates show that an increase of the growth rate of the latter by 1 percent in case of the established nature of the replacement of fixed capital leads to an acceleration of the decrease of the output-capital ratio by 0.4 percent (calculated according to [2, pp 38, 47, 287, 362, 366, 367]). For the slowing of this process, its stabilization and subsequent increase it is necessary to ensure a different ratio between the growth rate of fixed production capital and the number of people employed in physical production. This, along with the convergence of the dynamics of labor productivity and the production of output, will contribute to the further intensification of social production.

The fulfillment of these requirements presumes the need for the slowing ofthe dynamics of the capital-labor ratio by means of the shortening of the service life of fixed production capital. Then, other things being equal, the slowing of the dynamics of the capital-consuming form of scientific and technical progress and the acceleration of the growth of the capital-saving form will occur. Unfortunately, in the past decade a progressive change of the ratio between the increase of labor productivity and the capital-labor ratio, which conforms to the requirements of the intensification of social production, was not ensured, which led to the increase of the elements of the factor imbalance of the national economy as a consequence of the slowing of the process of the retirement of obsolete equipment and the extension of the service life of fixed capital, which was accompanied by the acceleration of the growth rate of the capital-labor ratio in the first half of the 1970's and the decrease of the dynamics of the placement of means of labor into operation in recent times. Thus, the average service life of the active portion of fixed production capital during 1971-1980 increased from 12.5 to 14.1 years, while that of the passive portion increased from 36.6 to 43.1 years. Here during the first half of the 1970's an acceleration of the growth rate of the capital-labor ratio occurred (from 7.2 percent in 1966-1970 to 7.6 percent in 1971-1975), while during the second half it decreased to 6.3 percent, yet not by the acceleration of the retirement of obsolete equipment, but by the slowing of the placement of fixed production capital into operation [3, p 22].

Such a change of the ratio between the dynamics of labor productivity and the capital-labor ratio was responsible for the failure to man a significant number of workplaces and predetermined a certain shortage of manpower resources under the conditions of the favorable demographic situation of the 1970's, during which approximately 10-12 percent of the increase of fixed production capital was redundant with respect to the available resources (given the formed level of its use). Even the consideration of the increase of the cost of production capacities cannot completely explain the existing discrepancy between the created workplaces and manpower resources.

The problem of ensuring a balance of the processes of the reproduction of fixed capital and manpower resources is manifested in different ways at the sectorial level. Given the overall surplus of workplaces with respect to the available manpower resources in several sectors there is a shortage of them (see [2, pp 48, 519]). Thus, in agriculture, transportation and, in part, construction, that is, in the sectors in which mobile equipment is used extensively, its relative shortage is being observed, and the task not of accelerating, but of slowing the retirement of the operating production equipment is arising.

The unbalance of the processes of the reproduction of fixed capital and manpower resources, which is responsible for the failure to man workplaces, creates the prerequisites for the involvement in the national economy of workers of relatively low skill, causes an increased turnover of personnel, adversely affects the intensity of labor and in the end hinders the intensification of social production. Therefore the assurance of the precise coordination of the processes of the reproduction of fixed capital and manpower resources is acquiring particular urgency under present conditions, while the optimization of the formed ratio between the dynamics of labor productivity and the capital-labor ratio is appearing as one of the most important socioeconomic problems.

The need "to take steps on the achievement of a balance of the available workplaces and the workplaces being created with manpower resources" is noted in the Basic Directions of USSR Economic and Social Development for 1981-1985 and the Period to 1990 ["Materialy XXVI s"yezda KPSS" [Materials of the 26th CPSU Congress], Moscow, Politizdat, 1981, p 141]. The balance of the factors of production with established reality involves first of all the slowing of the dynamics of fixed capital by the mass withdrawal of obsolete equipment (it is necessary to increase the proportion of its retirement among the operating fixed production capital by not less than twofold [3, p 53]), the priority allocation of capital investments to the sectors, which create the conditions for the rapid elimination of unskilled manual labor, and the improvement of the mechanism of the systematic freeing and redistribution of manpower.

In the future it is very important to establish the correspondence between the increase of fixed capital and manpower resources with a breakdown by territories. In regions with a shortage of manpower the limitation of new construction and the assurance of an increase of output at operating enterprises with a stable or decreasing number of personnel on the basis of the renovation of production and the modernization of equipment are

expedient. The scale of the systematically organized redistribution of manpower should be increased and migratory processes should be optimized.

It is necessary to concentrate new construction in places where a surplus of manpower resources is available, in case of the distribution of productive forces it is necessary to consider more carefully their specific nature locally.

The nature of modern scientific and technical progress, which is creating possibilities of the sharp increase of the efficiency of medium-sized and small enterprises and the efficient use of local natural resources, is an important factor which is making it possible to increase the role of small cities in the rationalization of the employment of the population.

Taking into account that the surplus of manpower resources in a number of regions of the country exists mainly in rural areas and is accompanied by the low migration of the population, it is necessary to devote special attention to the development of works, which have been brought as close as possible to the sites of the concentration of manpower and, first of all, to the construction site of enterprises of the agroindustrial complex. This will make it possible to achieve the full employment of the population in the indicated regions and to successfully implement the USSR Food Program.

The change of the proportions, which characterize the process of capital construction, within which the simple and expanded reproduction of fixed capital is accomplished, is of great importance for the intensification of social production and the acceleration of scientific and technical progress. Indeed, the shorter the period of their construction is in case of a given amount of capital investments, the more the latest achievements of scientific and technical progress are embodied in the means of labor which are being newly put into operation. The excessive lengthening of this period leads to their obsolescence already by the time of placement into operation. Therefore the task of speeding up scientific and technical progress is inseparable from the rationalization of the process of capital construction.

A quite substantial duration of capital construction has been characteristic of the development of the Soviet economy in recent decades. The quantitative description of the investment cycle in the sphere of physical production during 1961-1980, which was obtained on the basis of an equation with a distributed lag between the making of capital investments and the placement of fixed capital into operation, makes it possible to draw the following conclusions:

the largest portion of capital investments is embodied in the placements of fixed production capital into operation with a zero and the maximum lag;

the average period of the presence of capital investments in unfinished construction is nearly one-fourth as long in duration as the maximum period.

Given the average length of the period of the assimilation of capital investments during 1961-1980, which was equal to 1.2 years, it increased from

1.16 years during the 7th Five-Year Plan to 1.32 years during the 10th Five-Year Plan.

The most important characteristics, which influence the average duration of the presence of capital investments in unfinished construction, are their technological structure and the time of the construction of production facilities. With an increase of the proportion of equipment the time of one turnover of capital investments, other conditions being equal, decreases, while with an increase of the average time of the construction of production facilities it increases.

During recent five-year plans progressive changes have occurred in the technological structure of capital investments. From 1960 to 1980 the proportion of equipment in them increased from 39 to 45 percent [2, p 337]. This, other conditions being equal, was conducive to the shortening of the duration of the construction cycle and the improvement of the specific structure of fixed production capital. The further increase of the proportion of equipment in capital investments will promote the assurance of a balance of the national economy. At the same time it is necessary to note that this trend is forming as a result of the interaction of processes with different directions.

Thus, on the one hand, the use in construction of advanced construction materials and methods of building production facilities and the introduction of efficient types of machines lead to an increase of the proportion of equipment in capital investments. On the other, in a number of sectors of the national economy and industry (first of all power engineering, the fuel, chemical, timber, wood processing and pulp and paper industries, transport) it is necessary to build construction projects of particular reliability, which guarantee production safety and prevent the pollution of the environment. As a consequence of the interaction of processes with different directions in the future one should expect the further increase of the proportion of equipment in capital investments, but less intensively than in the past.

Along with the improvement of the technological structure of capital investments during the period being analyzed the construction lag increased. This, other conditions being equal, was a factor of the lengthening of the time of one turnover of capital investments, and their amount substantially exceeded the volume of the placement of fixed capital into operation. As a result of this the amount of unfinished construction increased. The ratio of it to the annual amount of capital investments increased from 69 percent in 1960 to 75 percent in 1975 [1, p 97]. In the five-year plan of national economic development for 1976-1980 a significant slowing of the dynamics of capital investments was undertaken for the purpose of ensuring a balance of the amounts of construction being performed at the same time with the possibilities of their physical backing. Their average annual growth rate during 1976-1980 came to 4.2 percent as against 8.4 percent in 1961-1965, 7.0 percent in 1966-1970 and 7.6 percent in 1971-1975 [1, p 97]. However, during the years of the 10th Five-Year Plan it was not possible to implement fully the adopted policy of the intensification of capital construction. At the same time as the slowing of the dynamics of productive capital investments the front of new construction increased significantly, owing to which the

ratio of unfinished construction to their annual amount in 1980 came to 87 percent. This process was halted somewhat only in recent years (in 1982 the indicated ratio came to 84 percent) [2, p 347]. Therefore the further intensification of the investment process for the purpose of ensuring the dynamic balance of the national economy is appearing as one of the basic tasks of the long-range period.

The decrease of the cost of a unit of power and the concentration of capital investments are the most important factors of the decrease of the construction lag. The increase of the cost of a unit of power adversely affects the level of balance of the sphere of capital construction. The increase of the cost of the unit power first of all is connected with the increase of the cost of construction and installation work as a result of both the change of prices and structural changes, which lead to an increase of the proportion of expensive components. The wholesale prices for basic construction materials, which are used in construction, increased in 1967: for products of ferrous metallurgy--by 50 percent, the timber and wood processing industry--by 42 percent, the construction materials industry--by 19 percent [4]. The increase of the cost of construction and installation work was due to the introduction in 1969 of new estimated prices, as a result of this given its practically unchanged cost the profit of contracting organizations increased by 33.5 percent. In the 1970's, although no mass revision of wholesale and estimated prices occurred, still the process of the increase of the cost of construction and installation work continued. The 1982 wholesale price reform, which again led to an increase of the prices for basic construction materials, gave a new stimulus to it.

The increase of the cost of the unit power is accompanied by the dispersal of capital investments among numerous construction projects. During the past decade the full estimated cost of projects being constructed simultaneously steadily exceeded the standard amount by 1.5- to 3-fold [3, p 21]. The reason for this is the inclusion of additional projects in construction, which inevitably causes the revision of the plans and estimates, the change of the range of output being produced, territorial shifts and systematic errors of planning and surveying organizations.

For the increase of the investment possibilities of the economy during the future period it is necessary to ensure a decrease of the cost of a unit of power by: the slowing of the increase of the cost of 1 m^2 of production areas; the introduction of more reliable types of machines and equipment for the extractive industry and the sectors which use mobile equipment; the more efficient use of basic technological equipment in the processing industry on the basis of the retooling of enterprises and the development of systems of machines, which increase production efficiency at all the stages of the processing of items; the decrease of the unfounded importing of expensive equipment. Along with this the regulation of the front of construction, which is being carried out at the same time, and the decrease of the ratio of the full estimated cost of construction to the annual amount of capital investments should be ensured. It is also necessary to orient the mechanism of economic stimulation and the system of construction financing more stringently toward the timely and high quality placement of production capacities into operation. It is necessary to increase planning discipline

cardinally and not to allow construction which is not envisaged in the five-year plan.

The creation of a firm basis of a balance in the national economy presumes the overcoming of the raw material, fuel and energy limitations of economic growth on the basis of the acceleration of scientific and technical progress. The change of the formed nature of the interrelations of the fund-forming sectors with the raw material, fuel and energy sectors corresponds to the adopted policy of the intensification of social production. This presumes the priority of capital investments in machine building for the purpose of the assurance of the rapid replacement of the operating means of labor in the sectors, which produce construction materials, and in the fuel and power complex, the realization in them of the resource-saving directions of scientific and technical progress, which correspond to the intensification of social production. The intensity of the intersectorial flows, which interconnect the fuel and power complex, the sectors which produce raw materials and materials, machine building and construction, should change as a result of a similar structural change in the distribution of investments. Such a structural shift will make it possible to overcome the increasing shortage of raw material, fuel and energy resources.

As the analysis made at the Scientific Research Institute of Economics and the Central Institute of Economics and Mathematics shows, for the present in the national economy of our country the structural changes of the interrelations of the sectors of the extraction and primary processing of natural resources are still not occurring actively enough. The expenditures of fuel and power, ferrous and nonferrous materials, as well as lumber, mineral construction materials and chemical products in the sphere of their processing and use in a number of cases remain at a high level, which is being accompanied by the use of material-consuming technological processes and equipment.

When evaluating the formed situation in the area of the production of raw materials, fuel and power it is necessary to take into account the objective worsening of the conditions of their production. This finds expression in the working of ores, which are less rich in useful components, the increase of the depth of mines and oil wells, the small thickness of seams of coking coals and the development of deposits which are located in hard to reach regions, which leads to the substantial increase of the cost of the production and transportation of raw materials, fuel and power. Moreover, the material and labor expenditures for the assurance of the achieved level of the production of minerals, especially in the oil drilling and coal industries, are increasing significantly.

The greatest strain in the structure of the interrelations of the sectors, which form the rate of economic growth, is forming with respect to the basic intersectorial flows, to which the fuel and power, which are supplied to the raw material sectors of industry, and the construction materials, which go to machine building and construction, first of all are assigned. This leads to a decrease of the growth rate of the output of the fund-forming sectors, which, other conditions being equal, predetermines the slowing of the retirement of obsolete equipment and creates the prerequisites for the worsening of the ratio between the capital-saving and capital-consuming forms of scientific and

technical progress and to the decrease of the intensive sources of development. Moreover, the slowing of the process of the retooling of the operating production equipment does not make it possible to introduce material- and energy-saving processing methods on an extensive scale, which creates an additional need for natural resources, promotes the acceleration of the dynamics of extensive factors and, if it is impossible to do this, in turn adversely affects the growth rate of the fund-forming sectors.

The excessively large proportion of the industrial sectors of the extraction and primary processing of natural resources does not make it possible to increase properly the share of the fund-forming sectors and first of all machine building in the amount of productive capital investments. Thus, whereas the share of machine building in the amount of productive capital investments from 1960 to 1970 increased from 7.8 to 10.8 percent, by 1980 it had increased to only 11.7 percent (calculated according to [2, pp 338, 339, 341]). Machine building under these conditions was inadequately prepared technically for the extensive introduction in the national economy of the resource-saving directions of scientific and technical progress. As a result the measures, which have been implemented in recent times and envisage the decrease of the strain in the supply of the national economy with raw material, fuel and energy resources, were implemented not always consistently.

The decrease of the share of the raw material sectors of industry in the total amount of productive capital investments, which began in the middle of the 1960's, presumed the tightening up of the policy of economy in machine building and the introduction of means of labor, which make it possible to increase the efficiency of the production of construction materials. However, the reorganization of machine building was inadequately backed materially. As a result a strain emerged in the deliveries of metals to machine building and construction, which slowed the growth rate of the output of these sectors and did not make it possible to step up the retooling of the national economy.

The process of the increase of the share of the productive capital investments, which are being channeled into the fuel and power complex of the country (from 13.2 percent in 1975 to 16.6 percent in 1982) [2, 5], which was connected with the sharp deterioration of the conditions of the production of fuel and the generation of power, began in the second half of the 1970's. Nevertheless, due to the inadequately high technical level of machine building and the use of power-consuming technological processes in the national economy even such a substantial increase of the productive capital investments did not make it possible to overcome the shortage of fuel and energy resources.

It is impossible to change quickly the formed interrelations of the sectors of the extraction and primary processing of natural resources with machine building and construction, since this requires a profound shift in the structure of productive capital investments. The stimulation of the investment policy, which makes it possible to accomplish the mass retooling of the functioning production apparatus and to overcome the raw material, fuel and energy limitations of economic growth, are a means of achieving a qualitatively higher level of the efficiency of social production.

The reorientation of the investment process toward the rapid retirement of fixed capital and its replacement at a qualitatively new technical level causes an additional need for capital investments. In this connection the increase of the proportion of the capital investments being channeled into machine building seems necessary.

It is also necessary to take more completely into account such a noninvestment factor of the development of this sector as the intensification of specialization and cooperation. For a long time machine building in our country was developed by means of the construction of new general-purpose enterprises, which made it possible to create a powerful general sector. Under present conditions the need has arisen for a sharp turn toward the specialization of machine building enterprises and for their freeing from the production of general-purpose tools and accessories for their own needs. The shift of the center of gravity in the assurance of economic growth from the sectors of the extraction and primary processing of resources to machine building also presumes the increase of the specialization of not only the enterprises themselves, but also the equipment being produced at them.

The interrelations which have formed between machine building and another fund-forming sector--construction--should undergo changes. The investment role of machine building will be enhanced owing to the increase of the proportion of equipment in capital investments and the broadening of the forms of the participation of machine building enterprises in the installation of equipment when placing production facilities into operation.

Substantial structural changes should occur within the sectors which produce construction materials, which will make it possible to improve the qualitative characteristics of the materials being used and to decrease their consumption per unit of output.

The thorough technical renovation of ferrous metallurgy lies ahead. It will ensure an increase of the quality and degree of economy of ferrous metals by the increase of the proportion of the steel, which is smelted in converters and electric furnaces, and the gradual rejection of the obsolete open-hearth process, an increase of the proportion of such an advanced technological process as the continuous teeming of steel and the more extensive use of the alloying of steel and monitoring over the entire cycle of the smelting of metal. Substantial reorganization should be accomplished in the output of rolled stock by means of the enlargement of the assortment and shaping, which will lead to the saving of metal and the decrease of its scraps in the process of machining.

The production of advanced types of construction materials--ferrous metals, plastics with preset properties, composites (metal-base laminates, metal-filled thermosoftening plastics and elastoplasts), laminated wood components and so on--should undergo preferential development.

Further significant changes, which are connected with the increase of the proportion of large construction components, plant-produced modular components and other efficient components, which ensure the decrease of the materials-output ratio, power-output ratio and weight of buildings and the decrease of

the cost of construction, are envisaged in the structure of construction materials. It is necessary to increase the proportion of monolithic concrete and brick with the simultaneous decrease of the proportion of reinforced concrete.

Considerable reorganization should occur in the structure of the fuel and power complex. The strategic policy of meeting the needs of the national economy for fuel and energy resources consists in the preferential increase of the mining of coal and the generation of nuclear power. In the immediate future an important role in the change of the fuel and power balance will belong to coal. This will make it possible to decrease gradually the proportion of petroleum in energy consumption and to use it mainly as a raw material for the chemical and microbiological industries. Great importance in the implementation of the strategic policy of the development of the fuel and power complex belongs to the increase of the level of recoverability of primary fuel from the ground and to the increase of the coefficients of the effective use of energy by consumers. Technical progress in the fuel and power complex will be aimed at the introduction of new highly efficient technological processes, which will make it possible to recover petroleum, gas and coal more completely, to decrease the specific expenditures of fuel on the basis of the increase of the unit powers of machines in electric power engineering and new machineless methods of the conversion of primary types of energy into electric power and to build powerful long-distance electric power transmission lines of a new voltage level. The use of atomic energy in heat supply will be new in power engineering (at present approximately 30 percent of the fuel and energy resources are consumed in this sphere) [2, p 55].

Thus, the gradual realization of the materials- and energy-saving directions of scientific and technical progress should ensure the systematic decrease of the proportion of material expenditures in the cost of the output being produced. The saving of the most important types of raw material, fuel and energy resources is a decisive factor of the meeting of the needs of the national economy for them. In the foreseeable future the systematic implementation of the material-saving function of scientific and technical progress will become an important factor of the decrease of the consumption of fuel, energy and raw material resources, and this in turn will influence radically the decrease of the capital-output ratio in the national economy, since raw materials, energy and fuel are produced in the most capital-consuming sectors.

FOOTNOTE

1. The calculations were made on the basis of the production function, which was developed at the Scientific Research Institute of Economics attached to the USSR State Planning Committee and is based on the hypothesis that the coefficient of elasticity of labor productivity with respect to the capital-labor ratio characterizes the ratio between the capital-saving and capital-consuming forms of scientific and technical progress. The introduction of such a hypothesis, as the results of experimental calculations showed, increases the statistical stability of the parameters being estimated and makes it possible to give them a clear economic

interpretation [1, pp 53-57]. At the sectorial level the estimates can differ from the cited ones, since along with the fixed capital and manpower resources here it is already necessary also to take material resources into account as an independent factor of economic growth.

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PROBLEMS OF INTRODUCING INNOVATIONS

Moscow PRAVDA in Russian 10 Sep 84 p 2

[Article by Doctor of Technical Sciences Professor V. Mukhin, director of the Iskra Special Design and Technological Bureau of the Ufa Aviation Institute: "Do You Mind If We Introduce?"]

[Text] The task of setting up the production from high-strength materials of thin-walled parts with a complicated irregularly shaped surface faced the Ufa Motor Building Production Association. Of course, it was possible to achieve what was desired by means of traditional methods of machining, having resigned oneself to the high labor intensiveness and production cost of items. But is this really the solution? The plant specialists and specialists of higher educational institutions decided to reject the traditional processing method and in place of it to introduce the process of machining metal by the combined action on it of high-speed electric erosion and anodic dissolution.

They conducted research, developed and produced special power sources, machine tools and control systems. As a result the entire technological process was reduced to a single operation, which completely eliminates manual labor. Here the productivity increased by five- to eightfold, the precision of machining and the quality of items increased significantly. The technological process and the equipment have been accepted for copying in the sector.

Precisely such a comprehensive approach to scientific research and experimental design work has become the rule at the Ufa Aviation Institute, a higher educational institution of primarily the technological type. The assignments of the comprehensive goal program in the area of technology are being fulfilled under the supervision of the institute as the main higher educational institution at 40 higher educational institutions of the RSFSR. The performers and base enterprises have been specified. Scientific production subdivisions--sectorial and problem laboratories, design and technological bureaus--have been organized at the higher educational institutions for the quicker and more extensive introduction of new equipment.

The associates of the Ufa Aviation Institute have begun the development of a regional system of the collective support of research. On the orders of the Bashkir Oblast Party Committee and the RSFSR Ministry of Higher and Secondary Specialized Education an educational scientific and experimental production

complex, which unites all the higher educational institutions of the autonomous republic, is being organized.

The taken steps are having a positive effect on the content and intensity of scientific research and experimental design work. Duplication has been eliminated. Unpromising themes have been eliminated from the plans. The introduction of the first "blocks" of the system of the automation of research has begun. The time of its fulfillment has been shortened. The concentration of computer equipment has increased. The organization of design and technological bureaus made it possible in a number of cases to realize the scientific reserve of chairs, as well as sectorial and problem laboratories.

Within the program tens of proposals on the development of new processing methods and models of equipment have been prepared. The inventions of scientists of our institute alone, which were introduced in 1983, provided an actual saving of more than 1.5 million rubles.

At the same time the improvement of the organization of research for the present have provided an appreciable impact only at the first stage--the performance of scientific research work. The second stage--the practical implementation of the results--in essence has not yet been regulated. The absence of large-scale introduction decreases the indicators of the economic effectiveness of developments. In the past 3 years at our institute with respect to technological themes it has not been increasing at all and comes to only 2-3 rubles per ruble of expenditures.

There are many reasons here. One of them is that so far it has not been possible to obtain the special-purpose financing of the technological program. I want to immediately stipulate that it is a question not of the allocation of additional resources. Many sectors through their enterprises all the same are spending these assets, concluding economic contracts with higher educational institutions. But these are hundreds, even thousands of separate studies, which in aggregate are not creating a fundamentally new, leading reserve in the area of technology.

Another matter is the comprehensive program, which envisages introduction and is balanced with respect to resource supply and the dates of fulfillment. It seems that it is time for the USSR Ministry of Finance and the USSR State Planning Committee to eliminate the contradictions which have appeared between the new organization of scientific research work of higher educational institutions and the obsolete forms of its standard legal support. This is also necessary for the more efficient use of the highly skilled personnel of the higher school in the interests of the acceleration of the progress of production.

The practice of concluding economic contracts, which regulate the cooperation of higher educational institutions and enterprises, errs in the direction of a large number of shortcomings. The main ones of them concern the introduction of innovations and the calculation of the achievable economic impact. First of all the contract itself is not considered a planning document, while the enterprise, which concluded it, is not obliged at all to use the results of the development of the higher educational institution. If by a line in the

contract the higher educational institution has been able to insert "to produce equipment," if it has been able "to end up" in the plan of new equipment of the plant and if this paragraph of the plan corresponds to the plan of the ministry, it is possible to hope that introduction will be carried out. However, it is far from always possible to overcome all these "if's." Therefore, of the 50 contracts, the fulfillment of which was completed at our institute in 1983, only half were crowned with introduction.

Difficulties are also arising with the calculation of the economic impact. At present only an actually achieved saving from the introduction of the results of research and development is required. If the theme is minor, everything is simple. But how, for example, is one to calculate the annual impact of a long-term program which ends in several years? How is the coperforming higher educational institution, which has completed its section, to determine it, while the main higher educational institution will complete the theme in a year or two? The appropriate departments should furnish higher educational institutions with procedural materials, which make it possible to evaluate the efficiency of the work being performed.

Of course, by cooperating directly with the plant, it is possible to introduce the results of research and to obtain a real impact. But most often this will be only improvements of a far from new processing method. While in order to develop processing methods of tomorrow, it is more advisable to work with design and planning organizations. The shortest route to shops, which are being built and renovated, of the fundamentally new processing methods, which the scientists of higher educational institutions are undertaking to develop, lies precisely through them.

The introduction and additional checking of innovations in the sectors are slowing down. Even when the processing method and equipment have been not only developed, but also tested, it is impossible to turn them over to enterprises without the consent of the sectorial scientific research institutes, which frequently conduct similar research. Assets and time are spent on the checking, the authority of the scientist of a higher educational institution suffers, and at times his authorship is also lost. And the more large-scale the proposal is, the more difficult it is to overcome the barrier. Why not endow on this level, for example, the scientific subdivisions attached to higher educational institutions (sectorial laboratories, design and technological bureaus), which have been set up by ministries, with the rights and duties of a sectorial scientific research institute? For many such subdivisions in the personnel potential, technical equipment, the quality and effectiveness of developments are not inferior to the laboratories of sectorial institutes.

The Achilles' heel of the scientific subdivisions of the higher school is the weak experimental production base of higher educational institutions. The steps on the development and intensification of the cooperation and specialization of experimental works between higher educational institutions (within the Bashkir Complex of Cooperation Between Higher Educational Institutions) are yielding fruits, but inadequate ones. For example, the Ufa Aviation Institute is a large educational scientific production complex, which consists of six independent organizations, which are carried on the state

budget, and cost accounting organizations. Each of them has its own "natural economy." The concentration of their resources, the consolidation and specialization of subdivisions and the maximum utilization of equipment are complicated and at every step run into obstacles--accounting, legal and the like. To place this matter on a clear legal basis means to speed up the development of new technology and the production of prototypes of new equipment and to increase the effectiveness of research.

For the acceleration of introduction at the same time as the new equipment the young engineers, who took part in its development, are being sent to the enterprises. It seems that such a practice will soon acquire a large scale, since the higher educational institutions and sectors of machine building have begun the designing and organization of versatile automated production systems, which are inconceivable without the close cooperation of specialists of different types. In these cases the purposeful training and distribution of specialists will greatly speed up the assimilation of new equipment.

The scientists of the higher school are striving to promote as much as possible the increase of the technical level and efficiency of production. The decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy" afforded extensive means for this. It is important to revise more rapidly the obsolete regulations and statutes, which are hindering the achievement of the greater effectiveness of the cooperation of scientists and production workers.

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INABILITY TO USE MONEY FROM CONTRACT WORK OF PAST YEARS EXAMINED

Moscow IZVESTIYA in Russian 25 Aug 84 p 3

[Article by V. Nevel'skiy: "Yesterday's Money, or How Saving Is Unprofitable"]

[Text] "Hi, Volodya! Pardon me for bursting in on you. I was passing by on Nevskiy, I remembered that you work here, and decided to drop in for a minute. My soul is tormented. I want very much to unburden myself. Perhaps, you will listen to me, eh?

"So then, yesterday I gave my son a 10-ruble note to buy products at the self-service store, having described in so doing the situation which had formed in our refrigerator.

"'I understand!' my son said and left, swinging a polyethylene bag.

"Speaking in legal language, we had concluded a certain deal.

"Half an hour later I, having unloaded the products from the bag and having discovered in passing their small value, ask the question point blank: Where is the change?

"'You gave me the money, I brought the food. We did not reach an agreement on the rest.' And he explained: 'We take an example from fathers.'

"Now I will have to curb my emotions and amplify something. First, I am not insisting that you would immediately set to work on a satirical article. Second, this is not an official complaint against my son, but a confidential conversation. Third, my word of honor, I did not give him such examples which are infectious.

"However, I have gotten carried away a little. But I did give them! In reality I did!

"I serve at a certain chair of a very eminent, as you know, higher educational institution. We do something there--in the scientific field. Something is obtained. In our views, this 'something' is significant. And here the next Client appears at the doorstep of the chair. We quickly find a common

language with him. A few words are always sufficient for complete mutual understanding: from you--money, from us--a scientific idea which is embodied in something just as real. We register the mutual understanding with a document, an economic contract. Speaking legally, we conclude a deal. For N thousand rubles, for n years.

"We begin to work. We work, as befits the scientific associates of a recognized higher educational institution, from the heart, conscientiously. Are you interested in the details? The first year we think. We do not yet know how to make what the party, which is financing us, needs. We spend little, let us say frankly, modestly--only for a quite modest wage. We ourselves feel awkward that we are not capable of more--in the sense of expenses.

"A year has passed. Aha, things have begun to go better. It is necessary to buy equipment. There is clearly not enough money according to the item 'Equipment.' But the accounting office grabs. Us. By the arm: stop, enough! We try to prove that last year quite a bit of money was left, we want to spend it, last year's money, today. 'It is not allowed,' the accountants stubbornly refuse. They say, that year is that year, while this is this.

"Well what would you do here? We grimaced. We rushed to the neighbors: let us work on your equipment. We held at the chair a mass meeting on the theme: it is necessary to save. With respect to all items of expenditures! The client is a part of the state, hence, the state benefits from our thrift.

"Oh, how proud we are! We are saving, we are saving. But now the contract is completed. A shortage arises. A significant one. But where is this money?

"With what have you become so bored? I have confused you, no? Then let me begin everything from the start. For a better understanding of what has been said.

"You understood? Well okay, let us go farther. Everything is clear with the case from family life: my son was joking. He returned the money to me--here is the balance for you. But if he had not returned it (there are still such sons), he would have spent it for sure.

"We, the chair, were not able either to return or to spend it. If it had been for business, if it had been during the new year, we would, of course, have been able to: we would have conducted new research and discovered something important. But conscience for the present does not make it possible to spend it in vain for something unnecessary, only in order to spend it.

"The most crucial moment of my conversation--the moment of the putting together of premises--are now arrived. Of course, not postal parcels, but the premises, which are the concluding quatrain of the canonical form of the ballad in the late Middle Ages. Do not be frightened, I read this definition in 'Slovar' literaturovedcheskikh terminov' [A Dictionary of Literature Terms].

"Only I will not rhyme my premises, they themselves are prosaic as it is.

"So, the first premise: where is the money, which was not spent by us during the first, second and other years of work, and why is it not allowed to spend it after 31 December of this year. Translated into an everyday situation this looks very strange. I say to my son: 'Was there change left over from the 10-ruble note. Fine. Tomorrow you are to go to the store again and spend the rest.' But the next day he says to me: 'That money is yesterday's. It no longer counts, it is not money. Give me new, today's money.'

"The result is such nonsense, if you think hard.

"The second premise: at the end of the work (N thousand rubles, n years), if we count properly, all the same there is a balance. There always is. If, I repeat, we approach the deal honestly, and we do not spend the contents of the purse, which has been opened before us, on something, say (remember Raykin), for a piano for a vegetable base, in order to keep potatoes in it.

"I am a honest man, I openly admit: there is a balance. So why not, as befits good sons, return it to the Client?

"The third premise: but, perhaps, the Client is leaving this very thing to us? In the form of a bonus for the saving of assets? No... it is a bit too much.

"You know, once our chair was able to conclude for a year a deal for nine scientific ideas at the same time. For the amount of 249,000 rubles. By the end of the year it had been possible to spend sensibly 140,931 rubles 71 kopecks. That is, the balance came to 108,068 rubles 29 kopecks.

"And this was a sort of horrible thing. We did not have the right to spend 29 kopecks for anything material after 31 December. It turns out that the money itself is not tangible bonds, not real coins, but something ephemeral. What is called the profit. But just whose profit? Ours? No. In the State Planning Committee they already consider it spent, in the ministry of the Client--all the more so. What has become of it? It is not clear.

"The fourth premise: in a verbal conversation with the Client our attempt to suggest to him to record officially the return of the unspent money led to a serious misunderstanding, and more simply speaking, doubt about the seriousness of our organization arose for him. 'You have gone crazy! We will have the nonfulfillment of the plan,' that is approximately what was said in response to our suggestion.

"The fifth premise: the prorector for scientific work said in a condemning tone: 'It is you, the chair, that overstated the estimate and could have incorporated a smaller amount in case of the contract....' How were we to incorporate it, if at that time we did not yet know what kind of amount would be 'less'! It is science all the same. One good idea, which has unexpectedly occurred to any of us, frees the chair from a lot of additional research and from the purchase of expensive equipment. One capable engineer, if while working he suddenly has an inspiration, will be able to measure everything

that we need on home-made equipment, having freed us from the burdensome worries which are connected with the acquisition of imported equipment or large quantities of our own.

"I mentioned the ordinal 'fifth,' but there was no premise at all by that number. Because it is clear as it is: it is to one's disadvantage to save the money of the Client, that is, the state.

"A cost accounting scientific association (KhNO), which is called upon--and which was set up for that--to ensure, as is stated in the statute on it, the economical expenditure of the assets, which are being allocated for scientific research to higher educational institutions, with the maximum scientific, technical and economic (anticipated and actual) impact, has been operating for a short time in the RSFSR Ministry of Higher and Secondary Specialized Education.

"And here is what I am now thinking about: probably, it is difficult for whoever receives a bonus at the cost accounting association, when all the money has been written off, although not spent, to settle all these questions. Still.... If according to some item there is not enough money, do you know what we do? Correct--we seek new Clients. For they also have money planned for research. They also have to spend everything. And in no case are they to receive the change! Change is not necessary. Otherwise there is a scandal.

"Imagine if my son had acted that way: he received a 10-ruble bill, bought 3 liters of milk, a container of sour cream and a loaf of bread, but there is no change?

"No, only bad sons act that way. Mine is good. He has known from childhood: change is also money."

The monologue of scientist Ya. Krupin was reproduced word for word.

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DEMANDS ON ASSOCIATES OF DONETSK FERROUS METALLURGY INSTITUTE

Moscow IZVESTIYA in Russian 2 Sep 84 p 2

[Article by Doctor of Technical Sciences Professor F. Dolzhenkov, director of the Donetsk Scientific Research Institute of Ferrous Metallurgy and deputy chairman of the Donetsk Scientific Center of the Ukrainian SSR Academy of Sciences (Donetsk): "The 'Deserter' of the Scientific Research Institute"]

[Text] We are both experiencing awkwardness. He because he has brought a resignation notice, I because I am obliged to agree to the loss of another senior scientific associate, a candidate of technical sciences, a person who is still young and was considered promising.

Before applying the official stamp, I ask a final question:

"Do you understand that this step cancels your scientific research future, and from a moral point of view it looks not too good?"

He understands, but already considers himself a self-supporting person and speaks somehow very freely about the fact that he has become tired of lengthy and frequent business trips to plants, that at our place it is necessary to work intensely "from whistle to whistle," that nowhere is there such a workload as at our scientific research institute. While a candidate of sciences would be able to have the same wage everywhere, and he will be half as busy.

Of course, after such a conversation you ponder many things. Also the fact that the board of directors and the institute's public organizations examined together another philistine, that not everything at our place is well with the remuneration of the labor of scientists, that the deserter of the sectorial scientific research institute is no longer only a fact, but also a phenomenon.

Without playing the hypocrite I will say that at the Donetsk Scientific Research Institute of Ferrous Metallurgy all the conditions exist for the pursuit of science. We have 52 excellently equipped laboratories, 14 technological and 6 auxiliary scientific divisions and our own experimental plant. In all 139 candidates and 5 doctors of sciences work in the collective, which together with the personnel of the pilot works numbers 2,500.

In recent years the institute has conducted many interesting studies, which are of great national economic importance. Among them is the development of a new processing method and equipment, which make it possible to decrease the consumption of coke when smelting pig iron by blowing coal dust into the hearth of the blast furnace. Many foreign firms have purchased at the Donetsk Scientific Research Institute of Ferrous Metallurgy licenses for the spray guniting of converters, which lengthens by twofold the overhaul life of the refractory lining in the steel-making unit. The annual economic impact from the introduction of our scientific developments in production exceeds 100 million rubles. In short, a real scientist can only dream about such conditions as exist at our sectorial institute.

And all the same certain candidates of sciences leave the sectorial institute (however, it would be better to say sectorial institutes) and rush to higher educational institutes, as well as academic institutes.

Why? The initially mentioned "deserter" told about this in plain terms: the wage will be the same or higher, in turn the responsibility is a bit less, there are no frequent business trips, the leave is not 24 days, but 36 or even 48 days and, moreover, during the summer. The work schedule is moderate. If you want to write a doctoral dissertation, write it, please, and do not grieve about whether or not it corresponds to the type of work of your institute.

Unfortunately, some of the candidates and doctors of sciences get over the "plank" at the highest mark only in the work of the dissertation, and then all their life reap the fruits of their record. The creative activity of many of them is declining. It is turning out that what was done in the dissertation remains the only contribution of some candidate or doctor of sciences. It seems that the certification of scientific personnel should become no less important a point than the point of the ordaining of scientists with the issuing of the corresponding diplomas.

How do things stand here today? Formally order is as if being maintained. All scientific associates are reelected to positions once every 5 years. And if the committee for the competition and the scientific council come to the conclusion that "so-and-so" does not meet the held position, "demotion" or dismissal awaits him. Is it not reasonable? However, this is theory. Practice looks different. Having learned of the unfavorable decision of the scientific council of the institute, the candidate of sciences immediately submits a notice of resignation at his own request. Some associates do this in advance, without even waiting for the meeting of the certification commission, if they are certain that the opinion about their conformity to the official position will be unfavorable.

That, in particular, is what happened at our place with Candidates of Sciences Leonid Rebrov and Valeriy Buynevich. The existing procedure was entirely on their side--the entry "At his own request" appeared in good time in their labor books.

Such young scientists, having received the diploma of a candidate of sciences, intensively seek jobs, which are a little more cushy, and find them primarily

at outlying higher educational institutions and at affiliates of higher educational institutions, where a shortage of instructors with academic degrees is felt.

It makes no difference to these candidates, whom one should call rentiers of science, whom they teach and train as specialists--construction workers, workers of trade or rail transport, if there is a fair wage.

Neither the Higher Certification Commission, the State Committee for Labor and Social Problems nor the Ministry of Finance has set any limitations for such people who are fond of a higher wage. The main thing is an academic degree, but they have it. Here the result is nonsense: not labor, but the degree is being paid for. Since 1980 20 candidates of sciences have been dismissed from our institute. Among them were people of a different level of talent, but of approximately the same moral outfit, which, of course, decreases the gravity of our loss. And all the same it does make a difference to us that V. Gubar', who became here a candidate of sciences and wrote a dissertation necessary for metallurgy, now works in a completely different specialization at the Makeyevka Construction Engineering Institute, that his colleague A. Dymnich, who defended a dissertation on the intensification of the processes of steel smelting in open-hearth furnaces, is also there. The already mentioned V. Buynevich proclaimed himself even more clearly. Having scorned his dissertation enthusiasm for steel making, he teaches labor safety techniques to the students of the Donetsk Affiliate of the Kharkov Institute of Railway Transportation Engineers.

Perhaps, today these scientists already know something with respect to the subjects which they teach, but they know it not at the level of candidates of sciences of the corresponding type. The fact that the Higher Certification Commission, while as a whole approving of such a situation, has already conferred the titles of docents on many of them, can cause only bewilderment.

It would be incorrect to think that we are speaking out in general against the exchange of personnel between scientific research institutes and higher educational institutions and are proposing such scientific serfdom. No, we sincerely welcome, for example, the transfer to Donetsk Polytechnical Institute of our Doctor of Sciences Professor I. Bornatskiy, who headed there the Chair of Steel Making. He, just as before, is working for the sector and is training young people.

And still as a whole the state of affairs with scientific personnel at the Donetsk Scientific Research Institute of Ferrous Metallurgy, just as at a number of other sectorial institutes of the Donbass, today forces one to ponder. Yes, we live in a society, in which the most important problems of socioeconomic development, including the development of science, are solved according to a plan. At the institutes important scientific production programs are being formulated and implemented, specialists of the highest skills are being trained through graduate studies and the seeking of degrees.

It seems that in the interests of all science and the entire national economy of the country several changes should be made in the corresponding Statute on the Certification of Scientific and Scientific Teaching Personnel and the

demands on the people, who have degrees and titles, should be increased. Apparently, it is necessary to give scientific councils the right to deprive of the candidate degree those people, who in two certification periods have not adequately shown their worth. The time has come to deprive of wage increases the candidates of sciences who are not working in their specialty.

Today sectorial science is the most vulnerable unit in the triad "science of higher educational institutions--sectorial science--academic science." And it is necessary to take steps more rapidly for the increase of its efficiency.

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VACANCIES FOR ACADEMICIANS, CORRESPONDING MEMBERS ANNOUNCED

Moscow IZVESTIYA in Russian 14 Sep 84 p 3

[Article by Academician A. P. Aleksandrov, president of the USSR Academy of Sciences, and Academician G. K. Skryabin, chief scientific secretary of the Presidium of the USSR Academy of Sciences: "From the Academy of Sciences of the Union of Soviet Socialist Republics"]

[Text] The USSR Academy of Sciences, including the Siberian Department, in conformity with Paragraphs 21 and 22 of its charter by this give notice of the available vacancies of full members (academicians) and corresponding members of the USSR Academy of Sciences in the following departments and specialties:

Departments; specialties	Number of vacancies: Full members (academicians)	Number of vacancies: Corresponding members of USSR Academy of Sciences
Mathematics		
Mathematics, including applied mathematics	3	4
General Physical and Astronomy		
Astronomy	1	-
Physics	1	-
Theoretical physics	-	1
Experimental physics	-	1
Quantum electronics	-	2
Radiophysics	-	1
Astronomy, space research	-	1
Nuclear Physics		
Nuclear physics	-	2
Physical Technical Problems of Power Engineering		
General power engineering	1	-
General power engineering, including plasma power engineering	-	1

Departments; specialties	Number of vacancies: Full members (academicians)	Number of vacancies: Corresponding members of USSR Academy of Sciences
Physical Technical Problems of Power Engineering (continued)		
Thermal physics, including cryogenics	-	1
Power and electrical machine building	-	1
Mechanics and Control Processes		
Mechanics	1	2
Machine building, including transport machine building	1	2
Control processes	1	2
Construction mechanics	-	1
Information Science, Computer Technology and Automation		
Information science	1	3
Computer technology	1	4
Automated systems	2	3
Element base, materials of computer technology and diagnostics	3	5
Physical Chemistry and Technology of Inorganic Materials		
Physical chemistry and technology of inorganic materials	1	-
Plasma chemistry and other new technological processes	-	1
Inorganic chemistry	-	1
Biochemistry, Biophysics and Chemistry of Physiologically Active Compounds		
Immunology	1	-
Soil science	-	1
Structural analysis of biopolymers	-	1
Biochemistry, biotechnology	-	1
Physiology		
Physiology of man and animals	1	-
Physiology	-	1
General Biology		
Biology	-	1
Ecology	-	1
Immunology of plants	-	1

Departments; specialties	Number of vacancies: Full members (academicians)	Number of vacancies: Corresponding members of USSR Academy of Sciences
Geology, Geophysics and Geochemistry		
Tectonics, structure of the earth's crust	1	-
Methods and techniques of prospecting for minerals	-	1
Prospecting geophysics	-	1
Working of petroleum and gas deposits	-	1
Petrography, mineralogy	-	1
Geochemistry	-	1
Seismology, aseismic construction	-	1
Oceanology, Atmospheric Physics and Geography		
Atmospheric physics	1	-
Geography	1	1
Oceanology	-	1
Problems of water resources of dry land	-	1
History		
USSR history, history of the Soviet economy	1	-
General history	1	-
USSR history (pre-October period)	-	1
USSR history (post-October period)	-	1
History of the CPSU	-	1
U.S. history	-	1
History of the socialist countries of Eastern Europe	-	1
History of the PRC	-	1
History of international relations and foreign policy of the USSR	-	1
Philosophy and Law		
Law	1	1
Historical materialism, scientific communism	-	1
Economics		
Soviet economics	1	2
Economics of the agroindustrial complex	1	-

Departments; specialties	Number of vacancies: Full members (academicians)	Corresponding members of USSR Academy of Sciences
Economics (continued)		
World economics and international relations	-	2
Construction economics	-	2
Literature and Language		
Literary criticism	2	5
Linguistics	2	5
Siberian Department		
Physics	2	1
Information science	1	1
Element base, materials of computer technology and diagnostics	1	1
General biology	1	-
Geology, geophysics, mining	2	-
Mathematics	-	1
Physical chemistry	-	1
Plant physiology	-	1
Mineralogy, petrography, geochemistry	-	2
Economics	-	1

In accordance with Paragraph 16 of the charter of the USSR Academy of Sciences, scientists, who have enriched science with works of foremost scientific importance, are elected full members (academicians) of the USSR Academy of Sciences.

In accordance with Paragraph 17 of the charter of the USSR Academy of Sciences, scientists, who have enriched science with outstanding scientific works, are elected corresponding members of the USSR Academy of Sciences.

The main duty of the full member and corresponding member of the USSR Academy of Sciences, in accordance with Paragraph 32 of the charter of the USSR Academy of Sciences, consists in enriching science with new achievements and discoveries by personally performed scientific research, the organization of the collective elaboration of leading scientific problems and the scientific supervision of this elaboration.

Full members and corresponding members of the USSR Academy of Sciences actively promote the introduction of the achievements of science in the national economy and their use in cultural development, perform work on the training and the increase of the skills of scientific personnel; are obliged to perform assignments of the Presidium of the USSR Academy of Sciences and the corresponding department, as well as to take part in the work of the General Assembly of the Academy of Sciences and the general assembly of the corresponding department.

Full members (academicians) and corresponding members of the Academy of Sciences, who have been elected to the vacancies specially envisaged for the Siberian Department, perform work at the scientific institutions of Siberia.

Full members and corresponding members of the academies of sciences, scientific institutions and higher educational institutions, state and public organizations are granted the right to nominate candidates for full members and corresponding members of the USSR Academy of Sciences in the specialties indicated in the publication. In case of the nomination of candidates by scientific institutions, higher educational institutions, state and public organizations it is carried out at meetings of academic and scientific and technical councils, collegiums or presidiums by secret ballot by a simple majority.

The names of the candidates for full members and corresponding members of the USSR Academy of Sciences with the corresponding explanation are to be reported in writing to the USSR Academy of Sciences within 1 month of the day of the publication (Paragraph 23 of the charter).

It is necessary to send the following documents (in two copies) for candidates for full members (academicians) and corresponding members of the USSR Academy of Sciences: the representation (decision) of the council, state and public organizations with the results of the secret ballot or the letter with the corresponding explanation in case of the nomination of the candidate by full members and corresponding members of the academies of sciences, an autobiography, the personal personnel registration certificate, a list of scientific works (form No 3.3), copies of diplomas on graduation from a higher educational institution, the doctor of sciences and the certificate of a professor, a description of the social production activity of the candidate from the basic place of work and three 4.5 X 6 cm photographs.

The indicated materials are to be sent to the address: 117901, GSP-1, Moscow, V-71, Leninskiy prospekt, 14, USSR Academy of Sciences.

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DEVELOPMENT OF TECHNICAL CREATIVITY OF MASSES

General Achievements

Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 84 p 1

[Article: "The Technical Creativity of the Masses"]

[Text] Scientific and technical progress is one of the most important factors of the increase of the efficiency of social production. Thousands of scientific research and planning and design organizations are constantly engaged in research and the development of new equipment. The representatives of academic and sectorial science and science of higher educational institutions and specialists of production associations and enterprises are making a significant contribution. The integration of science with production is a characteristic trait of the times.

Precisely the acceleration of scientific and technical progress and the introduction of new processing methods are the basis for the territorial sectorial program of the intensification of the economy of Leningrad and the oblast for 1985 and the 12th Five-Year Plan, which was approved by the CPSU Central Committee. The article on the program Intensifikatsiya-90, which is published in this issue, talks about this.

The mighty scientific and technical potential is being supported by the mass creative activity of millions of working people. Now more than 13 million workers, kolkhoz farmers, engineers, technicians and student youth are united in 108,000 primary organizations of the All-Union Society of Inventors and Efficiency Experts (VOIR).

During the 11th Five-Year Plan 23,000-24,000 inventions and about 4 million efficiency proposals have been used annually in production. Their introduction saves the national economy 7 billion rubles a year. Nearly a third of all the inventions and efficiency proposals were developed at public design bureaus and in creative multiple-skill brigades.

The public patent and design bureaus of the Bereznikovskiy Titanium and Magnesium Combine annually propose up to 150 technical innovations. The efforts of the active members of the primary organization of the VOIR are aimed at turning the combine into a completely mechanized enterprise.

Economic Impact From the Use of Inventions and Efficiency Proposals
(on the average per year; billions of rubles)

1971-1975	1976-1980	1981-1983
3.9	5.8	7.0

The experience of the organization of the technical creativity of the working people at the Zhdanov Azovstal' Plant can serve as an example which is worthy of imitation. In order to introduce a waste-free processing method, creative brigades, which coped successfully with the set tasks, were organized at the metallurgical giant in the most difficult directions.

Unfortunately, not everywhere is the movement of innovators acquiring the proper scope and yielding an appreciable return. Production workers are obliged to use more completely the opportunities for the development of technical creativity, which were made available by the Law on Labor Collectives.

Great importance is attached to invention in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy."

Chairman of the USSR State Committee for Inventions and Discoveries I. S. Nayashkov tells in the article on page 2 about how the tasks posed in it are being accomplished.

Inventions, Technical Progress

Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 84 p 2

[Article by Chairman of the USSR State Committee for Inventions and Discoveries I. S. Nayashkov: "Invention Is the Accelerator of Progress"; passages rendered in all capital letters printed in boldface in source]

[Text] A major program of operations, which are aimed at the increase of the technical level of the equipment and technology, which are being newly developed and updated, and the improvement of the quality of industrial output, was developed in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy," which was adopted a year ago. The envisaged achievement by domestic items of the highest world level is inseparably connected with active, purposeful inventor's research and the use of new original solutions in design and technological developments.

In 3 years of the current five-year plan more than 250,000 inventions were registered in our country and 72,000 were used for the first time. The economic impact came to nearly 8 billion rubles. This is far from the limit. We have the means both to introduce more and to obtain more completely a return from innovations.

An invention, being a technical solution of a qualitatively higher level, makes it possible to leave the beaten path, in order to discover additional means of the substantial increase of labor productivity in various sectors and the increase of the competitive ability of domestic equipment.

TODAY THE PRESENCE IN A NEW ITEM OF HIGHLY EFFICIENT, ADVANCED INVENTIONS IS THE CRITERION OF A HIGH SCIENTIFIC AND TECHNICAL LEVEL OF A DEVELOPMENT.

For complicated technical objects tens of inventions determine its "nature" and basic technical and economic indicators. The solution of a number of complicated scientific and technical problems is evidence of the high level of domestic developments which have been fulfilled in recent years. For example, a new type of lubricants, which implement the scientific discovery of the effect of nonwearing friction, was developed, which made it possible to increase many times the service life, for example, of pumps for the transfer of petroleum. A low-temperature technology of obtaining cement, which is also based on a discovery and is protected by 38 inventions, has been developed.

A large number of technical objects, which are being assimilated within the State Plan of USSR Economic and Social Development for 1984 and are based on domestic discoveries, in their technical and economic indicators surpass the best foreign analogues.

The KGU-500/4,5-140 cryogenic helium plant for the generation of low-temperature cold can serve as an example.

Under the conditions of the intensification of production the efficient and complete use of mineral raw material resources is acquiring greater and greater importance. Not by chance did the search for means of the additional obtaining of valuable products from secondary raw materials and production waste products become the main point of application of the forces of inventors. A method of processing lean tin-bearing raw materials, a technology of obtaining high-quality ceramic construction items made from low-grade clays and a process of extracting from sewage useful products of purification, which are of food and industrial value, are being introduced.

The high level of many domestic developments is confirmed by the great interest of foreign firms in the acquisition from us of licenses, know-how and technical experience. In 3 years of the current five-year plan 1.5-fold more license agreements were concluded than during the same period of the 10th Five-Year Plan.

SOVIET SCIENCE AND TECHNOLOGY HAVE SOMETHING TO BE PROUD OF.

And still the process of introducing scientific discoveries and inventions frequently takes place with difficulty, slowly, and at times also painfully, remaining not only the most important, but also the most limited section in the campaign for the acceleration of scientific and technical progress.

The proportion of objects of new equipment and technology, which were envisaged for assimilation by the plan for 1984 with the use of inventions, came to only 32 percent. A number of highly efficient machines and low-waste

processing methods with a large estimated, and in several instances confirmed economic impact did not receive extensive dissemination, in spite of our urgent recommendations and demands.

The Ministry of Tractor and Agricultural Machine Building produced only five prototypes of rotary grain combines like the SK-10. Meanwhile, in the opinion of the State Committee for Inventions and Discoveries, 33 domestic inventions, which were used in the design, place this machine on the level of the best combines of the world.

In the USSR Ministry of the Construction Materials Industry the assimilation of the technology of the recovery of the waste products of metallurgical production and the ash of thermal electric power plants for the output of slag glass, a valuable construction material, has not advanced beyond the pilot industrial phase. Here 14 inventions were used. The necessary recommendations of our state committee exist.

A new method of the abrasive working of materials in a magnetic field, which was developed on the basis of seven inventions at the Physical Technical Institute of the Belorussian SSR Academy of Sciences, makes it possible to increase many times the surface finish and the wear resistance of items. However, the Ministry of the Machine Tool and Tool Building Industry, without heeding the suggestion of the State Committee for Inventions and Discoveries, is not taking effective steps for the inclusion of this advanced development in the plan of the introduction of new equipment.

What is the reason for such a situation? The use of inventions, unfortunately, is still not adequately backed by the planning of the assimilation of new equipment. Frequently the introduction of inventions is not coordinated with the specific tasks on the decrease of the expenditures of materials, the saving of fuel and energy resources, the increase of labor productivity and the solution of other problems, which were posed by the decree on scientific and technical progress.

Such important economic indicators as the amount of the economic impact from the use of inventions and the amount of currency receipts from the sale of licenses, as a rule, are established from the achieved level, without consideration of the real scientific and technical potential, including the expenditures on the research being conducted and the availability of highly efficient inventions, which have been developed in the sectors. The minimum goal is set, consequently the result is also low. This is evident from the unjustifiably low proportion of the use of inventions in the total amount of introduced developments with respect to the Ministry of Tractor and Agricultural Machine Building, the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry, the USSR Ministry of Light Industry and several other ministries.

Scientific research and design organizations, the invention activity of which should be aimed at the development of fundamentally new equipment and technology, for the most part issue orders for minor, insignificant technical solutions with respect to the improvement of the existing objects of technology and the partial improvement and refinement of the characteristics

of known processes and materials. Its seems that many economic managers are poorly concerned about the future and underestimate the impact of the lead in technical thinking. But original, fundamentally new inventions, which substantially advance scientific and technical progress, arise on precisely such a basis.

I will note that from the point of view of the end national economic result the increased attention to the rapid development of the most important inventions is economically justified. The broader the sphere of dissemination and the scale of use of innovations are, the more significant the return is. It is expedient to give priority to such inventions when drawing up the plans on new equipment.

AT PRESENT THE EFFICIENCY OF THE LABOR OF THE DEVELOPERS OF NEW EQUIPMENT DEPENDS NOT ONLY ON THE CORRECTNESS OF THE CHOSEN DIRECTIONS OF NEW DEVELOPMENTS. THE COMPLETENESS AND OBJECTIVITY OF THE STUDY OF THE LEVEL AND TRENDS OF THE DEVELOPMENT OF NEW EQUIPMENT, ITS PATENTABILITY AND PATENT CLARITY ARE EQUALLY IMPORTANT.

The practice of the state scientific and technical appraisal of inventions attests that more than half of the results of the developments of organizations and enterprises, which have been declared inventions, are not recognized as such due to the lack of novelty and a positive impact from potential use in the national economy. Even many main organizations of ministries and departments, which are called upon to be the flagships of scientific and technical progress, do not want to renounce the official registration of proposed inventions for negligible improvements of existing designs and processing methods and cannot raise themselves to a qualitatively new level in the legal protection of domestic developments by certificates of invention. It is a question, in particular, of such important scientific research and design centers as the All-Union Heat Engineering Institute, the Institute of Ferrous Metallurgy, the All-Union Scientific Research Institute of Geophysics, the Scientific Research Institute of the Complete Mechanization of Animal Husbandry and the Ural Scientific Research Chemical Institute.

The results of the survey of patent subdivisions, which was conducted by the State Committee for Inventions and Discoveries, attests that in many instances the workers, to whom the organization and management of inventing and patent affairs have been assigned, are on the staffs of divisions, which perform completely different functional duties, for example, on standardization, the scientific organization of labor and so forth. Moreover, in most instances the patent experts in accordance with the salaries charts are not grouped with the workers of the basic subdivisions of enterprises and organizations, which hinders the attraction of highly skilled personnel.

Wherever the managers of enterprises and organizations devote proper attention to the patent services, wherever they are grouped according to the nature of the work being performed and the conditions of the remuneration of the labor of specialists with the basic, independent structural subdivisions, well-organized patent work in many ways contributes to a high level of scientific research and development, as is happening at the VNIImetmash and Kriogenmash

scientific production associations and the Institute of Electric Welding imeni Ye. O. Paton.

THE DECREE OF THE CPSU CENTRAL COMMITTEE AND THE USSR COUNCIL OF MINISTERS, WHICH WAS ADOPTED A YEAR AGO, SPECIFIED THE BASIC TASKS OF THE STATE COMMITTEE FOR INVENTIONS AND DISCOVERIES ON THE ACCELERATION OF SCIENTIFIC AND TECHNICAL PROGRESS.

These are the more complete exercise of the rights on the management of inventing and efficiency activity in the country, the monitoring of the quickest possible introduction of inventions in the national economy, the improvement of the standard documents on questions of invention and efficiency promotion, the improvement of the supply of developers of new equipment with purposeful and rapid patent information and active participation in the formulation of scientific and technical programs. Much has already been done in this direction.

All-Union State Standard 15.011-82 "The Procedure of Conducting Patent Research," the basic goal of which is to increase the influence of patent research on the level and efficiency of scientific research and experimental design work and to eliminate unjustified duplication of developments, was put into effect on 1 January 1984.

The abstract information on foreign innovations, which is now published by the State Committee for Inventions and Discoveries, has become to a considerable extent close to the needs of practice and more differentiated.

A procedure of preparing and submitting proposals on the drafts of the five-year and annual plans of USSR economic and social development with respect to the section "The Development of Science and Technology" on the use in the national economy of the results of completed scientific research and experimental design work, inventions and discoveries, which are of the greatest national economic importance, was approved jointly with the USSR State Planning Committee and the State Committee for Science and Technology.

The All-Union Review on the Maximum Utilization of Inventions and Efficiency Proposals in the National Economy, which was declared by the Central Council of the All-Union Society of Inventors and Efficiency Experts and the State Committee for Inventions and Discoveries for 1984-1985, will contribute to the further mobilization of the creative collectives of inventors and efficiency experts for the fulfillment of the tasks which were specified by the decree on scientific and technical progress. Honorary diplomas of two levels and monetary prizes have been established for the winners. The first results will be tallied at the beginning of next year.

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TECHNICAL PROGRESS, STANDARDS, PRODUCT QUALITY

Quality Control

Moscow EKONOMICHESKAYA GAZETA in Russian No 35, Aug 84 p 1

[Article: "Technical Progress and Standards"]

[Text] Owing to the constant, unabating attention of the CPSU to the development of science and technology our country in a historically short period has come to the front line of progress. The scale of the use in the national economy of the achievements of science and technology has increased substantially in conformity with the policy formulated by the party of the intensification of social production.

Under present conditions the increase everywhere of product quality has become one of the most important directions of the intensification of the economy. It is a question not only of the quality of items, but also of the conformity of their technical and economic indicators to the best world level. Precisely such tasks follow from the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy," which was adopted a year ago.

An important role in the improvement of product quality and the acceleration of scientific and technical progress belongs to the state system of standardization.

The use by industry of the advanced standard technical specifications, which have been developed within the 132 programs of comprehensive standardization (PKS's) now in effect, is providing during the 11th Five-Year Plan a saving of 2.9 billion rubles and is making it possible to save 20.2 billion kWh of electric power, 11.5 million tons of liquid fuel, 9.7 million tons of soild fuel and 1.5 million tons of ferrous and nonferrous metals.

The development of complex systems of quality control in accordance with the experience of the leading enterprises of Lvov and Dnepropetrovsk oblasts and Krasnodar Kray, which was approved by the CPSU Central Committee, has acquired a mass nature. Complex systems of product quality control have been registered at 27,000 enterprises. Sectorial quality control systems are being set up in 27 union and 20 republic ministries and departments. The Ministry of

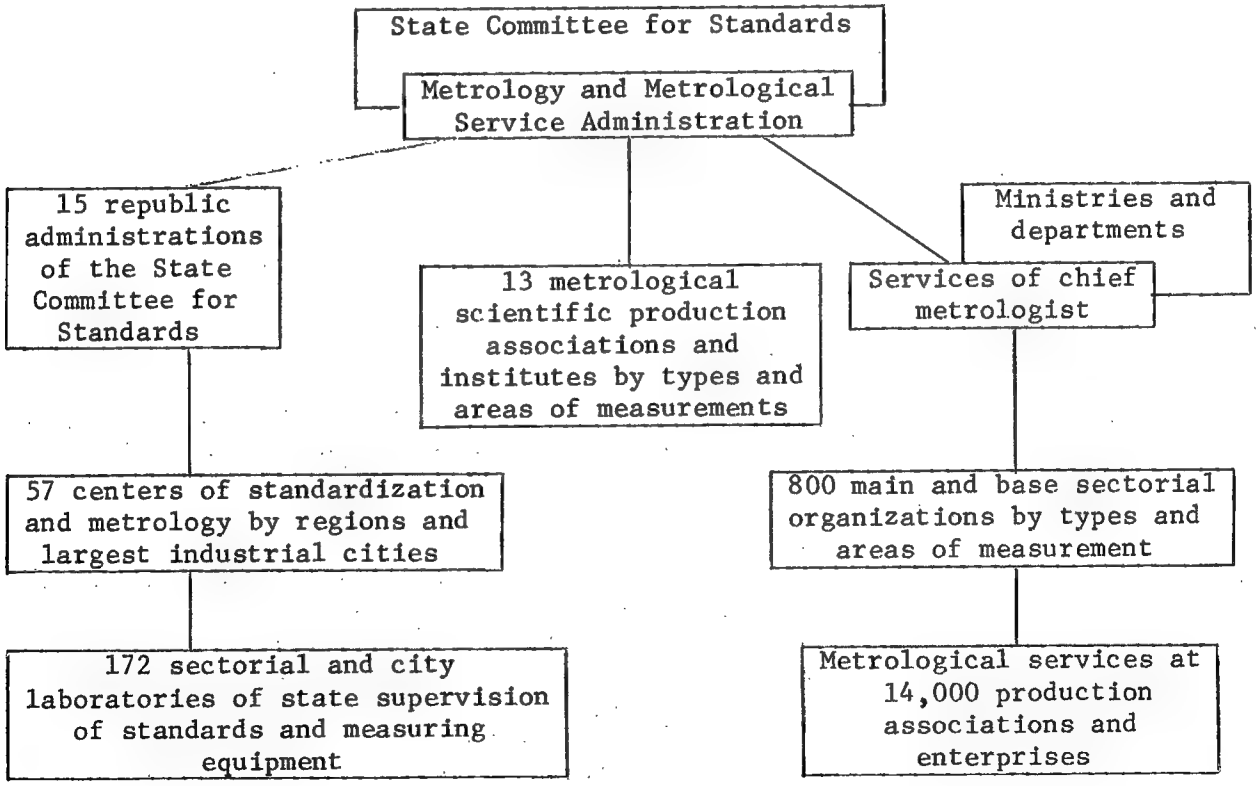
Instrument Making, Automation Equipment and Control Systems and a number of other sectors are displaying an example of the skillful use of the advantages of the goal program method in this matter.

Efficient quality control with a breakdown by territory is yielding a large impact. Positive experience has been gained in Moscow and Leningrad, in the Ukaine, Belorussia and Latvia.

At the same time, according to the data of checks of the State Committee for Standards, at many enterprises of a number of sectors proper attention is not being devoted to the problems of improving product quality.

A branched system of metrological service, as is shown in the diagram, has been set up in our country. The State Committee for Standards through its territorial organs and the sectorial services of the chief metrologists of ministries and departments is carrying out the strict monitoring of a uniform technical policy in this matter by sectors and cities, enterprises and associations.

Organization of Metrological Service of the Country



The assurance of high product quality and its bringing to the front line of scientific and technical progress are a matter of honor of every labor collective and every citizen.

Chairman of the USSR State Committee for Standards G. D. Kolmogorov in the article on page 2 tells about the work on the acceleration of scientific and technical progress and the improvement of product quality.

Standards, Quality, Efficiency

Moscow EKONOMICHESKAYA GAZETA in Russian No 35, Aug 84 p 2

[Article by Chairman of the USSR State Committee for Standards G. D. Kolmogorov: "The Standard, Technical Progress, Efficiency"; passages rendered in all capital letters printed in boldface in source]

[Text] A new stage in the increase of the efficiency of the use of standardization was specified by the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy," which was adopted a year ago.

THE DEVELOPMENT AND INTRODUCTION OF STANDARDS WITH INDICATORS, WHICH CONFORM TO THE LEADING LEVEL OF THE ACHIEVEMENTS OF WORK SCIENCE AND TECHNOLOGY, HAVE BEEN MADE THE CORNERSTONE.

This work has already been started, while in 1985 the changeover to a fundamentally new type of standards with long-range demands for groups of similar products will be accomplished in full.

The already available, although not very great experience of the formulation and introduction of standards with long-range demands shows their great efficiency. For example, the set of standards for the apparatus, instruments, devices and equipment of systems for the control of the technological processes of nuclear electric power plants with respect to many indicators surpass the analogues of leading foreign firms. The introduction in the national economy of the achievements of science and technology on the basis of the establishment and consolidation of the optimum indicators of the technical level, quality and efficiency, which are determined according to the results of basic and applied research, is speeding up.

At present the State Committee for Standards in consultation with the State Committee for Science and Technology and the USSR State Planning Committee has approved a list made up of 904 groups of similar products, for which state standards, which establish the general technical specifications, should be formulated. Their introduction and observance should ensure the steady output of competitive products, which conform to the world level of quality during the entire planned period of production.

A quite well-balanced system, which includes a set of interconnected documents, which are united by a special-purpose orientation, on the drafting of five-year and annual plans of specialization at all levels of management, the methodology of planning and the organization of the formulation of standards with long-range demands for groups of similar products, has been developed jointly with ministries and departments.

The assignments on the formulation of standards with long-range demands for groups of similar products should conform completely to the plans of scientific research and experimental design work, the assimilation of the production of new types of industrial products, the introduction of advanced technology and the mechanization and automation of production processes. Here it is necessary that the products list, the basic indicators of the technical level and quality, the dates of the fulfillment of the assignments and the performers would be the same both according to the plan of standardization and according to the plans of the development of science and technology.

The organization of an effective system of reliable information about the achieved and predicted world technical level of domestic and foreign products is a most important condition of the changeover to the formulation of standards which conform to the leading level of the development of science and technology. The united efforts of the corresponding organs of the State Committee for Science and Technology, the State Committee for Standards, the Ministry of Foreign Trade, the State Committee for Inventions and Discoveries, ministries and departments are necessary for obtaining such data.

Under the present conditions of the intensification of production the development and intensification of intersectorial and intrasectorial specialization and cooperation on the basis of the standardization of assemblies, parts, materials and structural components are acquiring a special meaning.

This year the State Committee for Standards has drawn up standard procedural documents, which specify the preparation of programs of the standardization and specialization of production, as well as the sequence of operations on intersectorial, sectorial and plant standardization. Using all this, the ministries and departments are obliged by 1 July 1985 to submit for approval to the USSR State Planning Committee, the State Committee for Science and Technology and the State Committee for Standards the programs of the standardization and specialization of the production of products of machine building, which are of the greatest national economic importance. The goal of these programs is the sharp increase of the output of standardized items in the total amount of machine building products on the basis of modular block and base designs and the rapid updating of production.

For the present designers and producers still far from always take into account the experience of their colleagues from other sectors and are not adopting the components of items of series-produced products, which have shown themselves favorably both in production and in operation.

For example, 25 plants of 8 sectors produce 53 types of refrigerators with a different makeup. This adversely affects the technical level and quality of service and increases the cost of the repair of equipment.

At the same time in instrument making, for example, a set of standardized standard components, which is regulated by only two state and nine sectorial standards, has been developed and introduced The introduction of such all-union state standards and sectorial standards made it possible to decrease the total number of type sizes of components from 1,302 to 617. The saving is

estimated at 6.5 million rubles. Positive experience exists in the Ministry of the Communications Equipment Industry. The work performed here on the standardization of the base load-carrying structures of electronic equipment is making it possible to decrease the number of their types to one-seventh to one-fifth, to decrease the labor intensity and the number of tools and accessories being used to one-tenth and to increase the use factor of metal from 0.5 to 0.75.

PRODUCT CERTIFICATION HAS BECOME AN EFFECTIVE MEANS OF INCREASING THE TECHNICAL LEVEL AND QUALITY OF ITEMS.

According to the data of the USSR Central Statistical Administration, the proportion of products of the highest quality category in the amount of products, which are liable to certification, came during the first half of this year to 44 percent.

Products of more than 80,000 descriptions now have the State Emblem of Quality. The USSR Ministry of Ferrous Metallurgy, the Ministry of the Chemical Industry, the Ministry of the Machine Tool and Tool Building Industry, the Ministry of the Automotive Industry and a number of other ministries are fulfilling the assignments of the five-year plan on the proportion of products of the highest quality category.

At the same time for the present a radical improvement of quality has not occurred. Not all the parameters of individual makes of passenger cars and trucks, agricultural and road machinery, color televisions and looms meet yet the present requirements. Unfinished models: without careful preliminary tests and the proper technological preparation, frequently are still being put into production The quality of items frequently decreases in the process of production. For this reason items of 226 descriptions were deprived this year of the Emblem of Quality.

A qualitatively new approach to the use of the advantages of certification was required. This found reflection in the decree "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy," in execution of which a new procedure of the certification of industrial products according to two quality categories was approved and put into effect on 1 July 1984.

The increase of the objectivity of certification, which will now be carried out only on the basis of product tests, which are conducted at competent testing organizations, is envisaged first of all. Moreover, unified state certification commissions, which are headed by consumers and, for the most important national economic products, by representatives of the State Committee for Science and Technology, will carry out the certification of products for not only the highest, but also the first quality category.

The demands on obsolete products are being made more strict. They should be removed from production within 2 months from the date of certification. Only in exceptional cases can the USSR State Planning Committee jointly with the State Committee for Science and Technology permit the production of items, which have not undergone certification, for a period of no more than 2 years.

Finally, the main distinction of the new procedure of certification: the strict criterion of evaluation--products of the highest quality category should conform in their technical and economic indicators to the world level.

Development of the Standard Base of the Country
(number of standards)

1970	1975	1980	1984 (plan)	1985 (plan)
14	94	128	136	142

The increase of the level of certification in many ways will be connected with the work of the main organizations for state tests.

At present 165 main organizations for state tests of 33 ministries and departments have been approved. More than 6,000 types of products have been attached to them. The procedural supervision and monitoring of the correctness of the conducting of the tests have been assigned to the State Committee for Standards.

Unfortunately, the efficiency of the work of several organizations is still inadequate. Thus, the household refrigerators of the Kishinev, Dushanbe and Samarkand plants freely underwent tests at the All-Union Scientific Research and Experimental Design Institute of Household Electric Machines and Appliances of the Ministry of Machine Building for Light and Food Industry and Household Appliances. Meanwhile these products do not conform to the present technical level in the materials-output and power-output ratios.

IN THE MATTER OF INCREASING THE TECHNICAL LEVEL AND QUALITY OF PRODUCTS THE METROLOGICAL SUPPORT OF THEIR PRODUCTION IS PLAYING AN IMPORTANT ROLE.

Reliable, highly automated measuring equipment is necessary when recording fuel, energy and material resources, as well as in health care, environmental protection and labor safety. All this requires a qualitatively new approach to the accomplishment of the tasks of the metrological support, development and production of highly efficient equipment.

A state metrological service and a state system of the assurance of the unity of measurements, for which a highly developed standard base is the basis, have been established. An analysis of the level of measurements, on the basis of which sectorial programs of metrological support have been formulated, has been made in the 34 leading sectors of the national economy with the participation of the State Committee for Standards.

However, in the metrological support of the national economy not everything is yet as would be liked.

The condition of the means of measurement, which are being used in agriculture, is causing alarm. For the correction of the formed situation at present a set of measures on the metrological support of the agroindustrial complex is being formulated and effectively implemented by the State Committee

for Standards with the participation of a number of ministries and departments.

AT THE RECENT ECONOMIC SUMMIT CONFERENCE OF THE CEMA MEMBER COUNTRIES THE INCREASE OF THE TECHNICAL LEVEL, RELIABILITY, DURABILITY AND QUALITY AND THE ENLARGEMENT AND SPEEDING UP OF THE UPDATING OF THE ASSORTMENT OF PRODUCTS WERE SPECIFIED AS ONE OF THE BASIC DIRECTIONS OF COOPERATION.

The formulation of CEMA standards at the level of present requirements with allowance made for the long-range needs of all the members of the community is making it possible to develop more successfully the economy of the fraternal countries.

We have prepared the corresponding proposals, which for the most part were approved by the July meeting of the CEMA Permanent Commission for Standardization. It is a question of the more purposeful planning of the formulation of CEMA standards for the priority support of the treaties and agreements on the specialization and cooperation of the production of the CEMA member countries, the development of CEMA standards for groups of similar products, which are the subject of reciprocal deliveries with the establishment of the most important technical and economic indicators at the level of world achievements, the expansion of the use of world standards as CEMA standards, a certain simplification of the procedure of formulating CEMA standards and, finally, the use of these standards in the treaties, agreements and contracts for the delivery of products with the CEMA member countries.

The organs of standardization are now working on the complicated and multilevel tasks, which are connected with the significant increase of the technical level and quality of the products which will be produced during the 12th Five-Year Plan, reorganizing their work in the spirit of the new requirements.

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WORK AT TOMSK INSTITUTE OF HIGH CURRENT ELECTRONICS

Moscow IZVESTIYA in Russian 26 Aug 84 p 2

[Interview with Corresponding Member of the USSR Academy of Sciences Gennadiy Andreyevich Mesyats, director of the Institute of High Current Electronics, by IZVESTIYA correspondent L. Levitskiy (Tomsk): "Vocation and Recognition"; date not given]

[Text] The discovery occurred where, it seemed, there is nothing to seek. The charge in a vacuum ceased long ago to be a mysterious stranger. Even a school child knows: if tension is fed, after an instant a blinding arc flashes. The instant is so quick that none of the scientists took it into account--up until the day when young researchers of Tomsk and Leningrad took an interest in it. Having taken an interest, they saw something incredible: microvolcanoes explode from the electric pulse on the surface of the metal cathode, emitting electrons.

The miniature explosions, which cause the discharge, also exploded the former notions about it. The instant turned into a scientific discovery, which was registered as the phenomenon of explosive electron emission, a new direction in physics, the establishment of the Institute of High Current Electronics in the Siberian Department of the Academy of Sciences and, finally, the aptly formed fate of the young scientists.

"In science there is no other means of acquisition than by sweat of the face...." Very likely, not everyone will agree with the categorical nature of these words, which were stated by A. Gertzen. But it is my profound conviction that they were said about G. A. Mesyats, director of the Institute of High Current Electronics. And all the same he himself, a corresponding member of the USSR Academy of Sciences and winner of the USSR State Prize, insists that the fortunate circumstances helped him.

"I was lucky," he says. "In the 1960's the need for a young reinforcement of science was keenly felt. Student research and early defenses of candidate and doctoral dissertations were encouraged in every way. The conditions for us, the Siberians, were especially favorable. The bold approach to the formation of new subdivisions of the Siberian Department of the USSR Academy of Sciences was aptly combined with the rich traditions of the higher educational .pa

institutions of Tomsk. We burst into science. We regarded the invitation to it as an enormous honor for ourselves.

"It seems to me that many graduates of today no longer perceive their arrival at an academic institute as a gift of fate. Capable fellows frequently reject it. And this cannot but cause alarm. The decrease of the attractive force of science and of the prestige of technical specialties alarms me."

The alarm of the man talking with me is also explained by the fact that at one time he was the first to head the Council of Young Scientists of the Polytechnical Institute and then of Tomsk and was chairman of the Council of Young Scientists attached to the All-Union Komsomol Central Committee. Therefore I ask Gennadiy Andreyevich to tell how he himself, while still a student, found his way into science.

"I was studying in the fourth year of the electrophysics faculty, when Candidate of Sciences Grigoriy Abramovich Vorob'yev came to our dormitory. At that time the Scientific Research Institute of Nuclear Physics, Electronics and Automation was being set up at the Polytechnical Institute, and Vorob'yev was selecting in advance associates for his laboratory. He offered the choice of several themes of course works. The obtaining of powerful nanosecond pulses interested me. It was necessary to start practically from zero: we ourselves were both theorists and designers of unconventional units.

"The proposal, which was made to me at that time, determined all my subsequent life. It followed the ideal scheme: a diploma, a candidate degree, a doctoral degree, I was in change of a group, then a laboratory, a department. Now I understand: this smoothness of the path--from the benevolence to the trust of elders.

"I am convinced that a boost and the tutorship of a venerable scientist are necessary for the novice. But at the same time one must not deliberately hold or keep too long young people: it is not ruled out that dependency and the habit of taking refuge in the opinion and authority of the supervisor will appear in them and the independence of thinking will disappear."

[Question] You were brought into science from the student's desk. One good turn always deserves another....

[Answer] At the three higher educational institutions of the city we have base chairs, give lectures, supervise course works, practical work, diplomas. Starting with the fourth year the students spend a day a week at our laboratories. For the more active ones we also find places, so that they would get more deeply involved in the collective and its affairs. Therefore very often the graduates, who have come to us, already have a reserve of research.

[Question] Hence, there are enough candidates for scientists. It would merely be a desire to attract young people and to help them to become firmly established.

[Answer] We will not oversimplify. Tomsk is a special city. There is somewhere here to draw personnel. But science is waiting for the most gifted ones, yet they are more and more often not going into science. The other day I met with the chairman of the Council of Young Scientists of the institute and the Komsomol organizers of the departments and asked them: Why did such very capable fellows not choose your institute when being assigned? They began to explain how the fate of the students, who 5 years ago had come to production and science, had formed. It turned out that the production workers, as a rule, had already received apartments, impressive salaries and lofty positions. Young people also compare all this, and when making a choice not the more interesting, but the better paying job frequently lures them. Especially those with families.

Of course, today there are also obsessed fellows, who would never leave science. But millions are employed in it. And it is hardly wise to count on universal enthusiasm. As sociologists claim, about half of the young scientists are engaged in research far from the full workday. Probably, the lack of personal discipline, the lack of organization of collectives and diversion for all kinds of incidental jobs also have an effect. At the same time junior scientific associates for the sake of additional earnings are joining brigades of independent contractors. There is something here to think about.

In scientific collectives, as nowhere else, an atmosphere of creativity, calm and recognition is important. It is necessary without fail to note and encourage well-done work and initiative. To encourage with thanks, a bonus, participation in conferences and symposiums. This cultivates the conviction that all your successes depend on personal capabilities and effort, and not on someone's good graces. Without faith in the future, one's own and that of science, confidence fades and is replaced by disenchantment.

[Question] New ideas often outgrow the organizational forms which have already been established. Hence frequent conflicts. How do you act in such cases?

[Answer] An excellent example of the solution of such a problem is the establishment at the Siberian Department of the USSR Academy of Sciences of institutes "for an idea." Various scientific research institutes appeared and were developed in precisely this way at Tomsk higher educational institutions. For this reason subdivisions of the affiliate of the Academy of Medical Sciences were also organized here.

Of course, it is pointless to organize new institutes, departments or laboratories in order to encompass as many directions as possible, which have appeared at the meeting points of sciences. Often it is more advisable to establish only good relations with related organizations. For example, we turned over to one of the higher educational institutions our equipment and a group, which was dealing with the machining of metal. There its research developed quite quickly into high-quality promising work. And although the group was formally separated from us, we are maintaining as before the closest contacts with it and are exchanging information.

Another example. Together with the Institute of Automated Control Systems and Radioelectronics we were able to develop and introduce a new class of electron beam units. This innovation interested the production workers, and now our electron guns have already appeared in many sectors of industry.

[Question] I was told that at your institute everyone to a man is enthusiastic about applied, specific engineering problems.

[Answer] This is an exaggeration. It is to say the least wasteful to diverse researchers for ordinary design work. Yes, we do have born engineers, for whom the development of a machine is a genuine pleasure. But we are not calling up all our associates to engage in the same thing. The scientist, as a trailblazer, realizes earlier than others what new ideas contain and where it is possible to implement them. Therefore it is his moral duty to promote what is new, to fight for it, without confining himself to a scientific publication or the obtaining of a certificate of authorship.

What do we do so that our next novelty would obtain recognition? In case of the first positive results we establish contacts with a sectorial institute or a scientific production association, try to interest them and begin to perform the work together with the client and at his expense. Moreover, the production workers, who have actively worked with us, become quite deservedly the coauthors of the publications and inventions.

[Question] Gennadiy Andreyevich, how is one to explain that during the times of your youth a doctor of science of "Komsomol" age appeared annually in Tomsk, while in recent years I do not remember for some reason the names of such doctors?

[Answer] This is characteristic not only of Tomsk. Today the amount of information, which it is necessary to assimilate before saying something new, before having one's say, is too great. In addition to everything else the former public interest in early defenses is now not being felt. The young age of the seeker of a degree frequently arouses distrust: Is he an upstart, is he a careerist?

Of course, for all ages in science the main thing is the significance of the results, the novelty of the research. But one must also not forget that hundreds of thousands of young specialists, who have their own problems--both social and professional--work at scientific research organizations. Not by chance was the joint decree of the All-Union Komsomol Central Committee, the USSR State Committee for Science and Technology, the Ministry of Higher and Secondary Specialized Education of the country and the USSR Academy of Sciences on work with young scientists adopted in the 1960's. To this day it has also not lost its topicality.

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CONTRIBUTION OF SIBERIAN DEPARTMENT TO SCIENTIFIC, TECHNICAL PROGRESS

Moscow IZVESTIYA in Russian 17 Sep 84 p 2

[Article by Academician V. Koptyug, chairman of the Siberian Department of the USSR Academy of Sciences: "The Policy Is Intensification"]

[Text] Scientific and technical progress is the basic lever of the turn of the economy of the country toward the path of intensive development. With progress along this path the demands not only on production, but also on science--its effectiveness and influence on the technical, technological and organizational level of the national economy--are increasing.

The main task of the USSR Academy of Sciences is the leading comprehensive development of research on basic problems for the creation and continuous supplementing of the potential of knowledge, on the basis of which it is possible to find rapidly solutions of the diverse problems of practice. Three important factors are contributing to the realization of the principle of comprehensiveness under the conditions of our Siberian Department of the USSR Academy of Sciences: the existence of highly skilled collectives of scientists in the majority of urgent directions of the natural and social sciences, the territorial proximity of scientific centers and a goal program approach in the planning of research on the most important and major problems.

Each new breakthrough into the unknown in the area of basic research gives rise to a "fan" of outlets into practice. As an example it is possible to cite the development by the school of Academician M. A. Lavrent'yev, one of the founders of the Siberian Department, of the theory of fast-occurring, including explosive, processes.

Industry is already using an entire range of different technologies of the explosion processing of materials. One of them is the explosion hardening of the parts of the tools of machines and devices, which operate under the conditions of percussion-fatigue wear. These are railroad frogs, tools of equipment for the mining industry, assemblies of many machines of the construction industry. At the Novosibirsk Switch Plant a specialized shop for the explosion hardening of railroad frogs has been built and 2 explosion chambers (in all there will be 6), which ensure the hardening of 7,000 items a year, are in operation. The service life of hardened frogs and parts of mining equipment is increased by twofold. Taking into account that many

thousands of tons of scarce high-manganese steel are being consumed in the country for their production, it is necessary to extend the new processing method to the enterprises of the Ministry of Transport Construction, the Ministry of Construction, Road and Municipal Machine Building, the Ministry of the Coal Industry, the Ministry of Nonferrous Metallurgy and the Ministry of Ferrous Metallurgy.

The explosion processing method has great prospects for the obtaining of clad metals, for example, steel coated with copper. In Novosibirsk this processing method is being used by the Sibelektroterm Production Association in the production of clad roofs of heat-treating ore furnaces. Here not only is a significant amount of copper being saved, but the service life of the furnaces is being increased by four- to five-fold.

At the Siblitmash Production Association the section of explosion welding for the application of antifriction copper alloys to steel when producing widely used plain bearings has been in operation for a number of years now. This processing method makes it possible to decrease to one-twentieth the consumption of antifriction copper alloys, to save 1,000 kWh of electric power per ton of products and to decrease the labor-output ratio by 20-30 percent. It is advisable to establish in various regions of the country shops of the centralized production of clad blanks for plain bearings.

The sphere of application of explosion processes is continuously being broadened. Among the latest achievements one should mention the new eddy powder method of extinguishing fires at gas wells. Its use enabled a small group in 1982 to put out in a few hours a fire at one of the gas deposits, with which 420 people, who used traditional methods, had not been able to cope in a month.

It would be possible to cite many such examples of the practical use of the achievements of academic institutions. And not only with respect to the work of the institutes of the Novosibirsk Akademgorodok, but also the scientific centers in Irkutsk, Krasnoyarsk, Tomsk, Yakutsk and Ulan-Ude. Thus, the discovery of the phenomenon of the explosion emission of electrons enabled specialists of the Tomsk Institute of High Current Electronics to develop equipment for the heat treatment of semiconductor metals, the welding of metal components of items and the defectoscopy of the welded joints of main petroleum and gas pipelines.

The Institute of Geology of the Yakutsk Affiliate of the Siberian Department of the USSR Academy of Sciences proposed a fundamentally new method of working diamonds, which consists in the contacting of the diamond at an increased temperature with a metal which is capable of dissolving carbon. Owing to this method it is possible to produce from a diamond parts and bits of any shape, to carry out faceting easily in the production of diamonds and to inscribe a drawing on them. This method has been patented in the United States, England, France, the Netherlands and Belgium.

The task of accelerating the development of the productive forces of this most important region of the country was one of the basic ones when organizing the Siberian Department of the USSR Academy of Sciences. Now it is being

successfully accomplished within the Siberia Program, which is unique in its scale and comprehensiveness. Its main goal is the scientific substantiation of effective means of the socioeconomic development of Siberia in the interests of the entire national economic complex of the country and the active promotion of scientific and technical progress of the region.

The program includes research, which is aimed at the solution of the key problems of the use of mineral, land, biological and water resources, environmental protection and the development of large national economic complexes (the West Siberian Petroleum and Gas Complex, the Kansk-Achinsk Fuel and Power Complex, the territorial production complexes of the zone of the Baykal-Amur Railway Line, the Angara-Yenisey region and others).

Practically all the subdivisions of the Siberian Department of the USSR Academy of Sciences and more than 350 scientific research, planning and design collectives and collectives of higher educational institutions, which represent 60 ministries and departments of union and republic subordination, are the performers of the Siberia Program. The increasing contribution to this program of the Siberian departments of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin and the USSR Academy of Medical Sciences should also be noted.

Siberian scientists are devoting serious attention to the tasks of the Food Program of the country. Taking into account the peculiarities of the climatic conditions of the agricultural southern part of Siberia--spring-summer droughts, the complicated weather conditions during the period of the harvesting of the crop, our scientists in recent years have been performing much work on the development of winter strains of grain crops. In 1984 the al'bidum-12 strain of winter wheat was regionalized in Altay Kray and starting in 1985 will be regionalized in Novosibirsk Oblast. They are preparing to advance into the fields even more promising strains of winter wheats. Estimates show that if 10 percent of the sown areas of Western Siberia and Northern Kazakhstan are changed over to winter wheats, it is possible to additionally obtain millions of tons of grain annually.

The 3-year tests in Kokchetav Oblast of a new technology of the aerosol treatment of grain crops with pesticides against pests have been completed. A new generator of aerosols, which was developed by the Institute of Chemical Kinetics and Combustion, is used in this technology. The cost of treatment by means of it as compared with aerial treatment is reduced by nearly one-half, the consumption of pesticides decreases on the average to one-tenth. It is necessary to speed up everywhere the extensive use of this technology.

A new type of meat and wool sheep has been developed as a result of many years of work of specialists of the Institute of Cytology and Genetics of the Siberian Department of the USSR Academy of Sciences, the Institute of Animal Husbandry of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin, the Novosibirsk Agricultural Institute and the State Breeding Association of the RSFSR Ministry of Agriculture. They yield 15-20 percent more meat and twofold more wool than the initial fine-wooled breeds of sheep.

The contribution of the institutes of the Siberian Department to medicine and health care is increasing. The Novosibirsk Institute of Organic Chemistry in cooperation with other organizations developed, while a works of the Institute of Nuclear Physics of the Uzbek SSR Academy of Sciences has assimilated the production of kits for radioimmunoanalysis with the use of phosphorus-32. These kits make it possible to make a rapid diagnosis of a heart attack, hepatitis and tick encephalitis. It is necessary to organize the extensive production of such kits and to develop the corresponding analytical service in the system of health care.

The Institute of Organic Chemistry developed the Milikhrom instrument, which makes it possible to separate and analyze substances in negligible quantities. In 1982 the Orel Nauchpribor Production Association began its production. This is making it possible to set up the production of medical instruments for biochemical microanalysis. The Siberian departments of the USSR Academy of Sciences and the Academy of Medical Sciences developed for them a comprehensive method of biochemical microanalysis for the 12 most important indicators with one-twentieth the total consumption of blood as usual.

While giving due credit to the great amount of work on the increase of the effectiveness of scientific research and the acceleration of the implementation of the results of scientific research in the national economy, which has been done in recent years by all the organizations of the Siberian Department, it should be admitted at the same time that much more can be done.

On the one hand, this is explained by the fact that not all the developments of our scientific organizations undergo proper production checking due to the lag in the development of the design and pilot production base of the Siberian Department. We hope to overcome this difficulty during the 12th Five-Year Plan with the support of the USSR State Planning Committee and the USSR State Committee for Science and Technology.

At the Extraordinary February (1984) CPSU Central Committee Plenum Comrade K. U. Chernenko stressed that the new five-year plan "should be the start of profound qualitative changes in production, a five-year plan of a decisive change in the matter of the intensification of all the sectors of our national economy."

Analyzing in this connection the tasks on the acceleration of scientific and technical progress, which face the Siberian Department of the USSR Academy of Sciences, we have come to the conclusion that in the organizational system, which was developed in preceding years, of the coordination and support of the work being performed in the interests of the national economy the link of the accompaniment of promising developments during their advance from pilot industrial tests to extensive multisectorial use should be strengthened. This presumes the further improvement of the cooperation of the Siberian Department with ministries and departments.

In conformity with this on the threshold of the new five-year plan there was made here a kind of "inventory" of developments, as a result of which there were selected about 200 major works, which have now been submitted to the USSR State Planning Committee, the USSR State Committee for Science and Technology,

the RSFSR Council of Ministers and the RSFSR State Planning Committee, as well as to 62 union ministries and departments with the suggestion to use them extensively in the national economy during the 12th Five-Year Plan. New technological and technical decisions, the introduction of which can ensure a significant saving of labor, resource and energy expenditures, the substantial increase of product quality, the enlargement of the assortment of products and the rejection of imports, make up a large portion of these suggestions.

The Siberian Department of the USSR Academy of Sciences hopes that after the analysis of the submitted materials in the ministries and departments, the departments and administrations of the USSR State Planning Committee and the USSR State Committee for Science and Technology precisely addressed recommendations on the acceleration and broadening of the introduction of these developments in practice will be drawn up and approved.

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KAZAKH SCIENCE, INDUSTRY COOPERATE TO INTRODUCE INNOVATIONS

Moscow IZVESTIYA in Russian 18 Aug 84 p 2

[Article by Academician A. Kunayev, president of the Kazakh SSR Academy of Sciences: "Bring the Hour of Introduction Closer"]

[Text] The Kazakh SSR Academy is one of the major scientific centers of the country. In 3 years of the current five-year plan our associates have turned over to ministries and departments 544 works with an economic impact of 213 million rubles. More than 200 innovations are being developed jointly with sectorial organizations. And still the path of any discovery or proposal from the idea to its introduction in life is very difficult.

Of course, in order to interest the sector in fundamentally new developments, it is necessary to go to it well prepared, so that at the enterprises they would see in introduction not an experiment with an uncertain finish, but a real advantage for themselves. In short, it is necessary to strive to meet each other half-way. The question was posed in precisely this way in the well-known decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy."

We meet regularly with the representatives of republic ministries and acquaint them with completed research which is of practical interest. The ministries in turn give us orders on the most important problems of their sectors. In short, in the "outlet" to the sector we see an important strategic line of our institutes and are striving to aim their research at the increase of the completeness of the use of raw materials, the saving of material, fuel and energy resources and the intensification of agriculture.

For example, it is impossible today to imagine in the republic the development of the ore base and the retooling of mining enterprises without the introduction of the suggestions of the Institute of Mining. Its scientists developed the most efficient technology of the mining of ore at the Dzhezkazgan, Achisay and Leninogorsk combines and actively assisted the introduction of self-propelled equipment at the mines of Kazakhstan. During the years of the 10th and 11th Five-Year Plans alone more than 300 works with an economic impact of 62 million rubles were introduced in the practice of the mines and open pits of the republic.

The Institute of Metallurgy and Ore Dressing developed a fundamentally new technology of obtaining copper, lead and zinc with the complete extraction of associated metals. It has been assimilated at the Irtyshsk Polymetallic Combine. The production of a rare element--gallium--has been organized at many aluminum plants of the country. Effective methods of processing secondary lead raw materials, which made it possible to decrease the cost and to increase the production of this metal, have been developed.

In the Ukraine they accepted the new technology of processing secondary lead raw materials very benevolently and willingly. The managers of Ukrtsink [not further identified] renovated the plant and built a powerful shop and electric furnace. The dates of the start-up of these facilities, as a rule, were punctually adhered to and were checked by the USSR Ministry of Nonferrous Metallurgy.

Unfortunately, it far from always happens this way. Frequently one is fated to go wrong at the exit from the laboratory, having in one's hands an already nearly finished development. Scientists rush about with their achievement from the doorstep of one enterprise to the doorstep of another, listen to approving assurances and receive a polite rejection.

For example, at petroleum refineries they obtain diesel fuel. Temperature measurements are needed for the evaluation of its quality. Now they take them by hand. A female laboratory assistant collects liquid in a flask from a pipe and runs with it to the central laboratory. And so it is during any season of the year: both in the heat and in the icy cold. Naturally, the analysis is already inaccurate.

At one of the laboratories they produced an original instrument, which automatically takes a sample of the fuel, measures the temperature and records it. It is advantageous, quick and economical. It would seem that it is necessary to put the instrument into mass production. They correctly said to us that its fireproofing is not envisaged, that it is necessary to enclose the instrument in a special housing. They notified the Ministry of the Petroleum Refining and Petrochemical Institute. From the ministry they reply: turn to Khimavtomatika [not further identified]. There they approved the instrument, but began to have doubts: Is it needed at all? They sent inquiries. It turned out that it is very necessary. Then they ask: But who will pay? Excuse us, they were amazed at the academy, your sector needs this! The endless correspondence has dragged out for 8 years, while at the refinery to this day they are pouring fuel into a flask.

I dwelt in detail on the drawn out incident with the small unit, because it is typical when deciding the fate of obviously indisputable innovations, which for long years do not make their way into life due to departmental indifference and the lack of base enterprises and pilot works. Hence the unfinished state of many important works, which are held up at the stage of pilot tests. Thus, for example, the introduction of a technology for the use of natural gas and oxygen when processing complex raw materials at the Chimkent Lead Plant was dragged out. But this technology makes it possible to

increase the furnace capacity by nearly a third and to decrease the consumption of coke by 40 percent.

It is possible to name many innovations in the area of nonferrous metallurgy and mining, which are useful to the national economy and are capable of radically improving production and the assimilation of which is being dragged out inexcusably. Of course, if our institutes had permanent and reliable pilot works and could independently give to industry completed developments, the introduction of many of them would be sped up appreciably.

There is, it seems, one solution--it is necessary to set up scientific and technical complexes (NTK's), at which designing would be carried out at the level of the corresponding institutes, while the pilot works would be an industrial enterprise, which produces only innovations. I have in mind the practice of the Ukrainian SSR Academy of Sciences. Our representatives recently visited Kiev, whether they familiarized themselves in detail with the activity of such a complex (the Institute of Electric Welding imeni Ye. O. Paton, the Institute of Superhard Materials and other institutions of the academy, with which we have good contact), once again compared the work in Alma-Ata and Kiev and came to the conclusion: the further accomplishment of large-scale tasks is impossible without the development and strengthening of the material, technical and experimental design base of the Kazakh Academy of Sciences.

We believe that it is necessary to transfer a number of sectorial institutes to the academy and the set up scientific and technical complexes on their basis. Here we do not intend to interfere with the interests of the ministries themselves. For example, the Kazakh Scientific Research Institute of Power Engineering of the USSR Ministry of Power and Electrification, NIIstroyproyekt [not further identified] of the USSR Ministry of the Construction Materials Industry and the Kazakh Scientific Research Institute of Geological Prospecting of the Kazakh SSR Ministry of Geology were set up and operated successfully within our academy. In the early 1960's they were transferred to the ministries. As a result the institutes turned into purely sectorial institutions without a fundamental theme. But meanwhile many problems of power engineering, the construction materials industry and geology, the prospecting and development of new petroleum and gas deposits are acquiring to an even greater degree an interdepartmental nature and require a thorough study and the more precise determination of their prospects and importance for the national economy of the country.

Multilevel problems, on the solution of which the development of entire economic regions depends, face science today, and the slightest miscalculations in the plan of their development leads to undesirable consequences for our economy.

They built, for example, in the city of Shevchenko on Mangyshlak a plastic plant with a capacity which is greater than all similar enterprises taken together. But then it turned out that local deposits cannot supply the giant plant. Now raw materials are being hauled thousands of kilometers. But it would have been possible to avoid the miscalculation, if the executives of the sectorial ministries had turned in time to specialists of the academy, had

treated their opinion attentively and had considered the conclusions of the local party and soviet organs, which know better the resources and possibilities of their territories.

Departmental interests, if everything is subordinate only to them, do not always promote the all-round development of one region or another. Assume that the Ministry of the Petroleum Refining and Petrochemical Industry takes petroleum from Western Kazakhstan. It goes directly through the pipes to Kuybyshev, while the petroleum refinery in Gur'yev, the only one in the region, which is literally next to the production site, is idle without raw materials. The producers fulfill the plan for their department, but it is all the same to them where the petroleum will flow. But on the scale of the country in this case alone tens of millions of rubles are being lost.

Is it possible to resolve all this reasonably? Of course! And already at the stage of research and planning. The USSR State Planning Committee could carry out more efficiently the coordination of the long-range and comprehensive development of regions on the scale of the country, by relying of local regional scientific centers. It is clear that any sector is not capable of providing a return for a long time in isolation of the development of the entire territory, on which it is opening its enterprises. Therefore it is so important to carry out in combination housing and cultural construction in the regions being developed and to support them scientifically and technically. It is necessary to take into account the contribution of each interested department in the strengthening of territorial industrial complexes and the return from this contribution.

Everything, which was said above, should be set down by contracts on scientific and technical cooperation between academic institutes and enterprises. The principle "an outlet to the sector," which we are implementing in our joint plans with ministries and departments, should be supplemented with a new principle. An outlet to the region. This not only will increase the leading role of the republic academy in the development of scientific and technical progress and bring closer the time of the introduction of new equipment and new technology, but also, which is the main thing, will promote the comprehensive development of the productive forces of all Kazakhstan and will increase its significant economic contribution to the national economy of the country.

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LATVIAN PARTY CHIEF ON ACTIVITY OF INVENTORS, EFFICIENCY EXPERTS

Moscow IZOBRETATEL' I RATSIONALIZATOR in Russian No 10, Oct 84 pp 4-5

[Interview with Secretary of the Latvian CP Central Committee Erik Yanovich Aushkap by the editor in chief of IZOBRETATEL' I RATSIONALIZATOR: "An Active Version"; date and place not given]

> [Text] The placement at the disposal of the All-Union Society of Inventors and Efficiency Experts of a portion of the materials, raw materials and energy, which have been saved by inventors and efficiency experts, could make this public technical organization a real and influential partner of production in the pursuit of the policy of the introduction of inventions.

[Question] Dear Erik Yanovich, what importance do you as a party leader attach to the activity of inventors and efficiency experts?

[Answer] Much importance. Enormous importance. These are people who are disposed to searching, to the intensification of the economy, people with a constructive approach to problems, to life in general.

The recent decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy" states that now the development of science and technology has become one of the main directions of the competition between the socialist and capitalist systems. In this connection, the decree notes, "the radical improvement of all the work on the acceleration of scientific and technical progress is a most important task of party, soviet, economic, trade union and Komsomol organs." Radical!

[Question] How would you comment on these instructions?

[Answer] To accelerate scientific and technical progress is a task of unusual importance and difficulty. It will not be accomplished without the broadest, without the mass movement of inventors and efficiency experts.

The party organizations of the republic in recent times have increased the attention to the movement of inventors and efficiency experts. The party

committees are directing much attention to the work on the organization of technical creativity and are helping the councils of the All-Union Society of Inventors and Efficiency Experts to cope with the arising problems. The party committees of the Riga Furniture Combine, the Riga Railroad Car Building Plant, the Avtoelektropribor Plant, the RAF Plant, which is well known throughout the union, and the Straume Plant--they produce household appliances here--the Biokhimreaktiv Scientific Production Association and the Institute of Civil Aviation Engineers are especially active in this respect. A comprehensive program, which envisages the saving of raw materials and materials and the introduction of the achievements of science and technology, was drafted and approved in Latvia under the supervision of party organizations. In the fulfillment of this program a significant share belongs to inventors and efficiency experts of the republic.

[Question] In recent times the innovators of Latvia have achieved appreciable gains....

[Answer] Well, in a conversation about gains one must not forget modesty. We still have enough difficulties and unsolved problems.

[Question] Nevertheless the USSR State Committee for Inventions and Discoveries and the Central Council of the All-Union Society of Inventors and Efficiency Experts in accordance with the results of the 1983 All-Union Competition awarded your republic a Challenge Red Banner.

[Answer] This, undoubtedly, is a high rating of the results of the activity of the innovators of Latvia.

We are keeping track of the development of technical creativity in the republic and know about the gains and difficulties. This year the Central Council of the All-Union Society of Inventors and Efficiency Experts heard the report of Ivan Dmitriyevich Taldonov, chairman of our Republic Council of the All-Union Society of Inventors and Efficiency Experts, on the development of mass technical creativity in rayon agroindustrial associations. A rayon agroindustrial association operates here in all 26 rayons of the republic, and innovators are giving substantial assistance in the fulfillment of the Food Program. The Presidium of the Central Council of the All-Union Society of Inventors and Efficiency Experts commended the positive work on the development of technical creativity in the rayon agroindustrial associations in our republic and, as far as I know, made the decision to acquaint all the republics and oblasts of the country with our experience. It is pleasing that the experience of Latvia in this respect can serve as an example. But it is also, of course, responsible.

As a whole the activity of inventors and efficiency experts of Latvia is developing successfully. The initial obligations of the innovators of the republic for the five-year plan are a saving of 430 million rubles by the introduction of inventions and efficiency proposals. In 3 years 336 million rubles have been saved. The obligation to save an additional 70 million rubles and to achieve, thereby, in accordance with the results of the five-year plan the level of 500 million rubles was adopted at the last plenum of the Republic Council of the All-Union Society of Inventors and Efficiency

Experts. Never yet have the labor collectives assumed such a high obligation. But, it seems, with the support of the party and trade union committees the innovators of the republic will honorably keep their word.

[Question] You spoke about the difficulties and problems, which face the developers of new equipment. Obviously, these problems concern not only the innovators of Latvia, but also the entire country. In what do you see the basic problem of scientific and technical progress at the present stage? Where, so to speak, is the sore spot of the technical development of production?

[Answer] Of all the sore spots of production I consider the assimilation of new equipment to be one of the most tender.

This subject is not new. In one aspect or another the problem has been repeatedly stressed by the press, including our journal. But it is too early to write off this theme.

The mechanism of the implementation of discoveries here for the present is still complicated and frequently operates ineffectively. I believe that invention as a whole as a process of social activity so far has been studied inadequately. It requires a closer look, a creative approach, apparently, experimentation, a search for new means for the animation of initiative.

We are producing an enormous amount of new machine tools and instruments, the more diverse equipment. But the technical level of the impressive range of items does not satisfy us. The time of the implementation of innovations is so great that by the time of their series production they are becoming obsolete. In the plans of the assimilation of new equipment there is literally only a handful of inventions of their total number. Within the plan there remains an immense number of innovations, the introduction of which has as if deliberately been allowed to take its own course. Such a situation is becoming intolerable, it needs a change and--let us recall the decree, with which our conversation began--a radical change.

[Question] What role could the All-Union Society of Inventors and Efficiency Experts play in the introduction of promising inventions?

[Answer] It is difficult to overestimate the activity of the organizations of the All-Union Society of Inventors and Efficiency Experts. In many ways technical creativity in our country has become a mass, appreciable phenomenon in the social and economic life of the country precisely owing to the All-Union Society of Inventors and Efficiency Experts. A state task of immense importance has been fulfilled--an enormous number of production workers and scientists have been acquainted with the culture of invention and with efficiency promotion. There is no doubt that during the years of existence of the All-Union Society of Inventors and Efficiency Experts the prestige of technical creativity has increased significantly.

But at the new, present stage of the life of the country should not the All-Union Society of Inventors and Efficiency Experts take a more active, more

economically significant stand in the assimilation of technical innovations? It seems that if along with the deduction of monetary assets the All-Union Society of Inventors and Efficiency Experts could use in accordance with its plans even a negligible percentage of the materials--metal, plastic, cement, fuel, electric power and so forth--which have been saved by inventors and efficiency experts, for the support of the work on the assimilation of some technical innovations or others, which have been developed by this society, the process of introducing inventions might receive an appreciable impetus.

In a speech at the Extraordinary February (1984) CPSU Central Committee Plenum Konstantin Ustinovich Chernenko spoke about the fact that "the new five-year plan first of all should become the beginning of profound qualitative changes in production, a five-year plan of a decisive change in the matter of the intensification of all the sectors of our national economy. The present material and technical base and the system of management should acquire new, higher qualities."

It seems that one of the essential aspects of this decisive change is to develop the economic mechanism of the rapid and efficient use of inventions and other innovations in production, and the All-Union Society of Inventors and Efficiency Experts could hold a prominent place in this process.

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PROBLEMS OF PRODUCTION AUTOMATION

Minsk SOVETSKAYA BELORUSSIYA in Russian 16 Oct 84 p 2

[Article by Doctor of Technical Sciences Professor L. Volchkevich, chairman of the organizing committee of the All-Union Scientific and Technical Conference "Problem Issues of Production Automation": "Problem Issues of Automation"]

[Text] The All-Union Scientific and Technical Conference "Problem Issues of Production Automation" opens today in Minsk. In all 250 scientists and specialists from more than 40 cities of the country, as well as delegations of specialists of CEMA member countries will participate in the conference. The article offered for your attention tells about what problems will be raised at the conference.

There is every reason to assume that the next decade will be critical in the development of completely automated and highly mechanized production. This is explained by the fact that the most urgent social necessity is being added to the scientific and technical prerequisites of automation, which have grown ripe in recent times.

In connection with the rapid increase of the educational, cultural and material level of the working people a contradiction between the volume of manual operations and the number of people, who agree to perform them, has formed and is quickly being aggravated.

There can be only one way out of the situation. In the decisions of the 26th party congress and a number of other party documents it has been repeatedly stressed that the general direction of our economy is complete automation, the development of complete automated systems of machines and instruments on the basis of advanced technology and modern computer equipment. They lead to the radical change of the forms and content of labor.

The comprehensive, systems approach in case of automation is a broad concept. It implies first of all not the pursuit of a partial, secondary, market-oriented result, but the complete coincidence of the tasks of automation with the priority tasks of the increase of production efficiency. Complete automation is the comprehensive study and solution at a new, higher level of all the components of the production process: the design of items and

technological processes, the basic and auxiliary equipment, machine tool attachments, systems of the control and monitoring of quality, personnel and the organization of production, the removal and disposal of waste products. At times it is sufficient to overlook or leave unchanged if only one of these components for all the work as a whole to prove to be inefficient. Thus, many models of new automated equipment and even entire machine systems proved to be poor because the efforts of the designers were aimed only at the elimination of the manual actions of man in case of control and manipulation. But the questions of product quality, the fast operation of mechanisms and devices and their reliability in operation were left without proper attention. As a result new equipment, which formally operates, as is now fashionable to say, in accordance with "unmanned technology," but is extra-expensive, unproductive and unreliable, is born. Consequently, it is also inefficient.

The violation of the principles of comprehensiveness in case of automation is not as harmless as this may seem. It has the result that when accomplishing specific tasks of automation at the production level the reasonable principles of technical policy are replaced at times by work in spurts.

The times, when automated production control systems were declared all but a panacea, are still fresh in the memory. This had the result that they permitted the assets for new equipment to be spent only on automated production control systems, they praised and lashed at automated production control systems. And a large number of enterprises and organizations undertook to develop at themselves something "resembling an automated production control system." Here neither the backwardness of the technology and equipment nor the low level of the organization and standards of production was taken into account. There would be an automated production control system. But then they did not know what to do with this automated production control system. It is necessary at times to pay a very high price for the simplest truth: it is simply unwise to manage in an automated way those who continue to work by hand.

Something of the sort is now being repeated with industrial robots. The attempts to reduce the automation of production to its robotization without the radical change of the technology and equipment of production caused inevitable costs and "misalignments" both in case of the development of robots and in case of their introduction. The influence of robotization on production efficiency (the quality of items, the productivity of equipment, the product cost, the output-capital ratio and so on), as a rule, is not evaluated and is not analyzed. The very fact of the presence of robots and, at best, the conditional freeing of several categories of workers are declared an achievement. The pursuit of prestigious figures had the result that not the designs and directions, in which robotization can yield the greatest impact (robots for welding, painting, the application of electroplating, the cleaning and conditioning of surfaces, technological control and so on), but the ones, which are a bit simpler--for example, robots for the loading of equipment, especially metal-cutting equipment, in which the potential opportunities of their use are the least--are being developed. Extra-expensive, slow-moving and unreliable designs are being copied.

The cited examples testify that the successful carrying out of complete automation requires not only immense labor of designers and process engineers, workers and engineers, but also major scientific generalizations, first of all the search for the most effective means of automation and the solution of arising scientific and technical problems.

The All-Union Scientific and Technical Conference "Problem Issues of Production Automation," which opens today in Minsk, should contribute to this. At it special attention will be devoted to the problems which are most urgent.

The first problem is the assurance of the flexibility of mass highly automated production. Today enterprises with mass production are being furnished with special equipment, on which readjustments are not envisaged. Therefore in case of the changeover to new models of items and new products a significant portion of the fixed capital--an enormous number of automatic and semi-automatic machines, automatic lines and their complexes, which are not worn out--is simply written off. New, again specially designed equipment takes their place. How is one to avoid this process, in what way is one to change over from special to adjustable automatic lines and automatic lines which can be rearranged? For the present the experience in this direction is obviously inadequate and the means of overcoming the difficulties are unclear.

The second problem, which will be discussed at the conference, is the complete automation of series production and the development of versatile automated production systems. The first models, which were developed on the basis of the known designs of NC machine tools, industrial robots, automated warehouses, microprocessor control systems and so on, are too expensive, are unreliable in operation and should be regarded as pilot testing grounds, as means of thorough scientific and technical exploration.

It is necessary to search patiently and persistently for means of increasing their efficiency. It is possible to achieve a decrease of the cost by the standardization of designs, the optimum structure and the reduction of the cost of the controlling systems; the increase of productivity by the changeover from batch to unit machining, the increase of the effective available working time, the changeover to equipment with the concentration of operations; the decrease of attendants by the increase of operating reliability, the decrease of manual operations and so on. This is a lengthy and complex process, which in the future should lead to the revolutionary transformation of the designs and arrangements of machines and especially to the organization of production on the basis of the multilateral use of computer technology.

The third problem, which will be discussed at the conference, is the problem of the improvement and the more efficient use of advanced automation equipment of mass use: industrial robots, handling and storing devices and loading devices. What steps is it necessary to take in order to increase the real yield of robotization, having aimed it in those directions in which it is most effective? So far only the science of the development and control of robots exists, the science of their efficient use in production is also necessary.

Whereas more than enough attention is being devoted to industrial robots and a number of other "fashionable" means of automation, a number of other components of modern production have turned out to be forgotten. This pertains first of all to machine tool accessories. Their technical level is decisive for product quality, for the fast operation of equipment and for the labor intensiveness of its maintenance. Meanwhile, at present up to 80 percent of the accessories are for manual use. A paradoxical situation has formed: we are developing the most modern microprocessor control systems, machines and robots, which perform the most complex working cycles, while the accessories remain manual. It is natural that the concept "unmanned technology" in such a situation is illusory, the freeing of workers from manual labor is becoming sweeping. It is also by no means unimportant that about 80 percent of the accessories are special, for one-time use and suitable only for one part or operation.

How one is to change this situation in the shortest possible time, how one is to change over on an extensive scale from manual special accessories to automated adjustable accessories of repeated use--this problem will be one of the most important ones for discussion at the conference.

Finally, there is the following issue. The notions that machine building and instrument making are ecologically safe and their influence on the environment and the health of man is incomparably less than, for example, the chemical industry, are still strong and tenacious. However, the rapid development of such technological processes as, for example, the application of electroplatings, significantly changes the picture. Complete automation should now also include not only the assurance of the output of a final product, but also the disposal of industrial waste products, their recovery or reclamation. Here the development of comprehensive systems on the scale of regions is promising.

Complete automation at today's stage of scientific and technical progress is first of all a set of problems, which frequently are solved with great complication and difficulty. And the better we understand these problems and see the real difficulties and the means of overcoming them, the greater the successes in this most important matter will be.

7807
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SECOND PLENUM OF ALL-UNION COUNCIL OF SCIENTIFIC, TECHNICAL SOCIETIES

Moscow KUZNECHNO-SHTAMPOVOCHNOYE PROIZVODSTVO in Russian No 2, Feb 84 pp 2-4

[Article: "The Second Plenum of the All-Union Council of Scientific and Technical Societies"]

[Text] Workers of the CPSU Central Committee, the All-Union Central Council of Trade Unions, ministries and the USSR Academy of Sciences took part in the work of the plenum.

The plenum discussed the question of the participation of scientific and technical societies in the fulfillment of the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy."

Academician A. Yu. Ishlinskiy, chairman of the All-Union Council of Scientific and Technical Societies, delivered a report.

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy" is an important step in the direction of the implementation of the policy of the intensification of social production, which was formulated by the 25th and 26th CPSU Congresses, and the decisions of the November (1982) and June (1983) CPSU Central Committee Plenums on the cardinal increase of labor productivity on the basis of the extensive and rapid introduction in practice of the achievements of science, technology and advanced know-how.

The task was posed to ensure in the next few years the output of machines and equipment, instruments and other products, which conform in their technical and economic indicators to the highest world level.

The extensive automation of technological processes on the basis of the use of automated machine tools, machines and devices, standardized modules of equipment, robotic complexes and computer technology is the most important direction of the work on the acceleration of scientific and technical progress. The USSR State Planning Committee, the State Committee for Science and Technology and the USSR Academy of Sciences have been chargedto formulate with the participation of interested organizations all-union programs of work

in the area of the development of versatile automated production systems and automated designing systems and their use in the national economy. The task is posed to ensure in the next few years the output of products of only the highest and first categories.

An important role in the accomplishment of these tasks is assigned to the scientific and technical community. Our main task is the organization of the actual participation of the members of scientific and technical societies in the fulfillment of the plans and in the development of high quality products. The creative plans and obligations of the primary organizations of scientific and technical societies on the fulfillment of the plans of new equipment should serve as the scientific engineering support of the counterplans and socialist obligations of labor collectives.

The speaker directed attention to the need for the active participation of scientific and technical societies in the work on the increase of product quality.

In 1984 the industrial products, which do not conform to the highest and first quality categories, will be removed from production.

Experience in the making of appraisals of the technical level of the output being produced has already been gained in individual organizations of scientific and technical societies. Thus, for example, significant shortcomings in the design and technological process of the manufacturing of the machines, which are produced by the Syzran'selmash Plant, were detected by the scientific and technical community of Kuybyshev Oblast as a result of a careful analysis. A plan of operations of the primary organization of the Scientific and Technical Society of the Machine Building Industry of the plant, creative brigades and sections on the elimination of the detected shortcomings was drafted.

A. Yu. Ishlinskiy devoted much attention to the questions of standardization. In the decree of the CPSU Central Committee and the USSR Council of Ministers it is outlined to draft programs of the standardization and specialization of production for 1986-1990 and the period to 2000.

The organizations of scientific and technical societies and first of all of the machine building industry need to take a most active part in this work.

The role of scientific and technical societies in the promotion of scientific and technical achievements and in the shortening of the time of the development of machines is great. Creative associations and personal creative plans of the members of scientific and technical societies are conducive to this.

The Latvian Republic Council of Scientific and Technical Societies, in which forms of the monitoring of the fulfillment of the comprehensive programs have been developed, has positive experience. In the republic 84 scientific and technical programs are in effect: of them 47 are republic and 37 are union programs. Working groups, which check the fulfillment of the comprehensive programs, have been set up by the Latvian Republic Council of Scientific and

Technical Societies. Measures of public influence are used in case of the detection of a lag.

A. Yu. Ishlinskiy noted that not all the organizations of scientific and technical societies are yet promoting properly advanced methods of the accomplishment of technical progress. It is necessary to use more thoroughly the promotion of advanced know-how through the Houses of Technology. The All-Union Council of Scientific and Technical Societies has drafted a plan of measures on the fulfillment of the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy."

Academician I. A. Glebov, chairman of the Leningrad Oblast Council of Scientific and Technical Societies, reported on the work which is being performed on the fulfillment of the plans of scientific and technical progress in Leningrad and the oblast. Four main directions have been outlined: the development of the fuel base, the automation of production, the implementation of the Food Program and environmental protection. I. A. Glebov directed the attention of the plenum participants to the need to increase the quality of the measures being implemented. Every measure should envisage an economic impact, a decrease of manual labor and the number of workers and a saving of raw material and energy resources.

First Deputy Chairman of the USSR State Committee for Standards V. I. Kiporenko noted that the increase of product quality, the introduction of advanced technology, the decrease of the metal content of products and the maximum standardization of assemblies and parts in machine building are the main thing in standardization. The role of scientific and technical societies in the accomplishment of these tasks is great.

The Central Board of the Scientific and Technical Society of the Machine Building Industry jointly with the State Committee for Standards held a conference, at which they discussed the question of the participation of the community in carrying out standardization in machine building.

Corresponding Member of the USSR Academy of Sciences K. V. Frolov, chairman of the Central Board of the Scientific and Technical Society of the Machine Building Industry and director of the Institute of Machine Science imeni A. A. Blagonravov, noted that new equipment, the productivity of which exceeds the productivity of existing equipment, is being developed and new plants are being built. This is inconceivable without the mechanization of all operations. At the enterprises of Dnepropetrovsk Oblast, for example, seven robotized works have been set up. At the Uralmash Plant much work has been performed on the organization of waste-free production with the participation of scientific and technical societies. K. V. Frolov noted that in the sectorial journals the members of scientific and technical societies should publish everything advanced that exists at machine building enterprises.

Doctor of Technical Sciences V. I. Leont'yev, chief of the Administration of the Consolidated Scientific and Technical Plan of the State Committee for Science and Technology, dwelt on the role of scientific and technical societies and the All-Union Council of Scientific and Technical Societies,

which they should play in the fulfillment of the decree of the CPSU Central Committee and the USSR Council of Ministers.

Corresponding Member of the USSR Academy of Sciences P. G. Bunich indicated that all our work should be performed with allowance made for economic expedience. It is necessary to use stimulation for the introduction of new equipment and technology. At the same time the withholding of stimulation (not less than 25 percent of the bonus) should be applied to managers of enterprises for the nonfulfillment of the quantitative and qualitative indicators.

Member of the CPSU Central Committee and Secretary of the All-Union Central Council of Trade Unions V. N. Makeyev stressed that the decree of the CPSU Central Committee and the USSR Council of Ministers is of strategic importance. The fulfillment of the plan of scientific and technical progress is the main thing in the work of scientific and technical societies. Unfortunately, not all the organizations of scientific and technical societies are actively participating in the work. The experience of the Uralmash Plant, the scientific and technical societies of the Latvian SSR and others is being disseminated poorly. It is necessary to step up the work on the saving of material resources. The patronage work of scientific and technical societies on the fulfillment of the comprehensive plans should be improved, the experience of the leading organizations should be disseminated more extensively.

The scientific and technical society is holding tens of contests, and it is necessary to introduce more actively in production everything new and advanced which has been commended in these contests.

I. S. Fadeyev, director of the Kuybyshev House of Technology, told about the work on the dissemination of advanced know-how. At the House of Technology exhibitions on robotics, schools and courses of advanced know-how and seminars are in operation, the means of introducing the most valuable developments, which are exhibited at the enterprises of the oblast, are discussed and outlined.

Corresponding Member of the Latvian SSR Academy of Sciences Ya. Ya. Liyelpetr, chairman of the Latvian Republic Council of Scientific and Technical Societies, Ye. B. Feygin, chairman of the Krasnoyarsk Council of Scientific and Technical Societies, and others also spoke at the plenum of the All-Union Council of Scientific and Technical Societies.

In the adopted decree the Second Plenum of the All-Union Council of Scientific and Technical Societies charged:

1. The central boards, the republic, kray and oblast councils and boards of scientific and technical societies and all members of society to accept for guidance and fulfillment the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy," regarding the tasks posed in it as the most important and priority direction of the activity of scientific and technical societies.

To discuss the tasks, which follow from this decree, at the plenums and meetings of the presidiums of the organizations of scientific and technical societies and the meetings of the active members of scientific and technical societies, to draft and implement plans of measures on the accomplishment of the tasks which follow from the decree of the CPSU Central Committee and the USSR Council of Ministers.

2. The organizations of scientific and technical societies in their activity on the acceleration of scientific and technical progress are to proceed from the fact that in the next few years domestic industry should ensure: the output of machines, equipment, instruments, materials and other products, which conform in their technical and economic indicators to the highest world level, as well as the introduction of progressive processing methods and advanced methods of the organization of production and, on this basis, the substantial increase of labor productivity in all the sectors of the national economy.

It is necessary to concentrate the efforts of the scientific and technical community on the accomplishment of the urgent tasks of the development of the national economy, on the development of fundamentally new types of equipment and technology, which ensure the efficient use of fuel, energy, material, manpower and raw material resources and environmental protection, on the active promotion of the large-scale introduction of the achievements of science and technology in production and on the automation of the national economy.

3. The councils and boards of scientific and technical societies, the Houses of Technology of scientific and technical societies, the Palaces of Culture and Technology of trade unions are to step up the promotion of the achievements of science and technology with the extensive use of the press, radio, the cinema and television and by the organization of exhibitions, reviews and contests. Here the main attention is to be devoted to the promotion of scientific discoveries and high efficiency inventions, the experience of the introduction of the results of scientific research and development in production, the work on the increase of the technical level and quality of products, the activity of the leading scientific research, design, planning and design and technological organizations, higher educational institutions, associations and enterprises on the fulfillment of the decisions of the CPSU Central Committee and the USSR Academy of Sciences, which are aimed at the further acceleration of scientific and technical progress.

4. The plenum approved the plan of measures of the All-Union Council of Scientific and Technical Societies and the central boards of scientific and technical societies, which was drafted by the Presidium of the All-Union Council of Scientific and Technical Societies, on the fulfillment of the tasks which follow from the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures on the Acceleration of Scientific and Technical Progress in the National Economy."

The Second Plenum of the All-Union Council of Scientific and Technical Societies examined the fulfillment of the budget of the scientific and

technical societies of the USSR for 1982 and approved the consolidated budget for 1984.

7807
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ORGANIZATIONAL STRUCTURE OF DEPARTMENT OF CHIEF TECHNOLOGIST

Moscow MASHINOSTROITEL' in Russian No 8, Aug 84 pp 41-42

[Article by Candidate of Economic Sciences A. M. Voychinskiy: "The Improvement of the Organizational Structure of the Department of the Chief Technologist"]

[Text] One of the most effective methods of decreasing the production cost of new items, which are developed at scientific research institutes and design bureaus, is the standardized method of its planning. Here it is necessary to constantly improve the standard base for the calculation of labor expenditures, the level of producibility of prototypes and the rates of consumption of materials.

For this purpose at one of the scientific research institutes the department of the chief technologist was reorganized and a scientific and technical subdivision--the base standard technological division--was established in it (the organizational structure of the department of the chief technologist is shown in the diagram).

The base standard technological division (BNTO) includes the following subdivisions: the scientific research sector (NIS) of the producibility of items; the scientific research sector of the standards of labor intensiveness; the technological bureau (TB) of material standards.

Included in the structure of the scientific research sector of the producibility of items are the groups of: the leading technologists who are the deputy chief designers of items for technology; the checking of design documents and the development of the design for producibility; the analysis of the producibility of items. Among the functions of this sector it is possible to note the following:

the formulation jointly with the developing and design subdivisions of highly producible designs, which requires the development of the item at all the stages of its designing and production;

the carrying out of the technological control of the conformity of the detail designs to All-Union State Standard 2.121-73;

Key:

1. Chief of department of chief technologist
2. Economic planning group
3. Scientific and technological division of complete microminiaturization
4. Deputy chief of department for automation of production
5. Base standard technological division (BNTO)
6. Scientific research sector of producibility of designs
7. Scientific research sector of standards of labor intensiveness of items
8. Technological bureau of material standards
9. Scientific and technological division of the technological preparation of production
10. Sector of the technological preparation of production
11. Sector of the designing of accessories
12. Technological bureau of group methods of machining
13. Deputy chief of scientific and technological division
14. Scientific research sector of the automation of the control of the technological preparation of production
15. Technological bureau of technological documents (with an archive)
16. Technological bureau of tool services
17. Tool shop
18. Section of masks
19. Shop technological bureaus
20. Scientific research sector of the development and introduction of chemical technological processes
21. Division of the automated control system of technological processes
22. Scientific and technological division of the development of the automated designing system
23. Scientific research sector of the development and introduction of the technological processes of assembly, installation, welding, soldering and heat treatment
24. Division of the mechanization and automation of production
25. Scientific and technological division of the development of a versatile automated production system

participation in the technological preparation of the production (TPP) of prototypes and the provision of technical assistance to the plant in their production;

participation in the drawing up of guiding instructions on designing, the technical and economic characteristics (TEKh's) of items, charts of the technical level (KTU's) and quality;

the making of a calculation of the indicators and an analysis of the producibility of items at all the stages of their designing and production (in accordance with the corresponding range of indicators);

the drafting of plans of measures, which will make it possible to bring the individual indicators of producibility up to the standard value;

participation in operations on the standardization of design and technological solutions in conformity with the classifier of parts of assembly units;

participation in the technological preparation of the production of series-produced specimens, the conclusion of contracts on technical cooperation with manufacturing enterprises for the purpose of achieving the directive labor intensiveness and the desired value of the producibility of the item;

participation in the development of a sectorial system of the evaluation of the producibility of items.

The scientific research sector of the standards of the labor intensiveness of items includes the groups of: technical standardization; the specification of the planned labor intensiveness of the prototypes of items for the plant; the calculation of the rated labor intensiveness of items. The scientific research sector works on the following tasks:

the standardization of the technological processes of the production of prototypes of items for the plant;

the drawing up and turning over to the production control division of a list of the labor intensiveness by shops and occupations in conformity with the enterprise standard "The Procedure of the Transfer of Technical Specifications to the Works";

the revision of the norms and the adjustment of the values of the labor intensiveness of the production of an item in conformity with its development for producibility;

the calculation and establishment at the stage of preliminary designing along with the base indicators of the producibility also of the planned conditional total value of the limit labor intensiveness of the production of the item;

the calculation and establishment of the value of the rated labor intensiveness of the production of the prototype, as well as the assignments by years of its achievement in series production;

the calculation and establishment of the directive labor intensiveness of the production of recurrent items, the implementation of measures on its decrease at the pilot plant;

the comparative analysis of the labor intensiveness of the production of items of different generations of radio electronic equipment (REA), the formulation of consolidated standards of the labor intensiveness of standard parts and assembly items.

Included in the technological bureau of material standards are the groups of the standardization of: materials; precious metals; critical and new materials. This subdivision works on the tasks:

the determination in accordance with the design and technological documents of the norm of the need of materials and precious metals for an item and the checking of their actual consumption;

the introduction in production of advanced rates of consumption of materials and precious metals, the checking of the fulfillment in the shops of the assignments on the decrease of the rates of consumption;

the substantiation and defense of the consolidated rates of consumption of critical and new materials;

the establishment of the influence of the materials, which are used when producing an item, on its producibility, labor intensiveness and production cost.

Thus, the base standard technological division works on a set of tasks on the evaluation and the development of items for producibility, and the labor intensiveness of the production of an item, its materials-output ratio and production cost should be predicted when submitting technical proposals. The evaluation of an item at later stages and the measures on the increase of the producibility often lead to a change of its design to such an extent that this is equivalent to expenditures on the development of a new item. The gathering of the initial data for the reliable calculation of the producibility, the prediction of the labor intensiveness and the drawing up of the technical and economic characteristics and the charts of the technical level presents the greatest difficulty. With the development and designing of a new item at an enterprise it is proposed to fill out the cards of assembly items and to enter on them the necessary initial data. Moreover, the training of the chief designers and their deputies in development, designing and technology, the calculation and evaluation of the producibility and labor intensiveness of items, as well as the certification of these specialists for knowledge of the standard technical specifications (NTD) have been organized. The technological preparation of the manufacturing enterprise and its participation in the development of the prototype are of great importance, since the production cost of an item is determined to a significant degree by the conformity of the organizational and technical level of the plant to the producibility of the item being manufactured by it.

7807
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KALUGA OBLAST PLANT HYDRAULIC MOTOR PRODUCTION DELAYED

Moscow EKONOMICHESKAYA GAZETA in Russian No 35, Aug 84 p 17

[Article by O. Artynskiy, EKONOMICHESKAYA GAZETA correspondent, Lyudinovo, Kaluga Oblast: "Not a Simple Story"]

[Text] There's no avoiding the facts: hydraulic motors designed by the Mining Institute imeni Skochinskiy have a difficult fate to bear, although the motors came out glorious. And not just one or two, but a whole series with ratings from 90 to 1,770 kW. They have been patented in all industrially developed countries. The field of their application is a wide one--mining, road construction and transport machinery of various purposes, shipbuilding, power engineering, and the petroleum and cellulose industries.

In a letter to the USSR State Committee for Science and Technology representatives of the USSR Ministry of the Coal Industry noted that the use of new hydraulic motors "...will permit the development of reduction gear-less stoping, tunnelling and transport machines with automatic regulation, which would lead to a 15-20 percent increase in the output of mining machines, a 2 1/2 times increase in their service life, and a 30-40 percent reduction of their mass."

The whole question consisted of deciding where series production of these motors should be organized? Due to their technical level, the machine building plants of the USSR Ministry of the Coal Industry were unable to fabricate such complex assemblies with high quality. Specialized enterprises were needed. They existed in the Ministry of the Machine Tool and Tool Building Industry. But that ministry flatly refused to produce the Mining Institute motors, explaining this by stating that they were of a narrowly special purpose nature. The debates on this matter went on between the two ministries for over ten years. During this period, import licences had been purchased for the production of hydraulic motors which in their technical specifications were inferior to the units of the Mining Institute imeni Skochinskiy.

Moreover, during this time the Lyudinovo Assembly Plant was built. Incidentally, the money for its construction was provided by the machine building ministries in order to receive products of a multi-purpose multi-sectorial nature from it in the future. But the plant took such a long time to be built, that the Ministry of the Machine Tool and Tool Building Industry "forgot" about it, and began to produce its output, including low-powered hydraulic motors of a

design by VNIIgidroprivod [All-Union Scientific Research Institute of Hydraulic Drives], primarily for its own needs.

At the plant they were familiar with the Mining Institute hydraulic motors. The USSR Ministry of the Coal Industry proposed that the Ministry of the Machine Tool and Tool Building Industry organize their production at the new plant. But due to their bureaucratic positions, neither the ministry nor the plant felt the slightest inclination to start up their production. Four different directors assumed that position at the enterprise, but the once worked-out position remained in force. Even now, very little in it has changed.

A coincidence helped to bring the motors and the plant together. About ten years ago the Mining Institute units were installed in the hydraulic drive of a ship lifting chamber and the swing unit of a ship lifting lock at the Krasnoyarsk GES. About 200 hydraulic motors were built at the Berdyansk Yuzhgidromash Plant. The order was an incidental one for the builders, and the motors were built just "so-so." Still, they have performed for a total of about 10 years at the Krasnoyarsk GES. Of course, during the operation some design deficiencies were discovered. But on the whole, the units did a fairly good job. For this reason, officials of the GES and the Lengidrostal' Special Design Bureau of the USSR Ministry of Power and Electrification proposed that the institute improve the design of the hydraulic motors. This is how the new, more economical and longer lasting units appeared.

But they had to be made somewhere. And not at just any incidentally available enterprise as before, but at a specialized one. On these points, only the Lyudinovo plant was suitable. Why? There are unused production capacities, skilled workers experienced in manufacturing hydraulic motors, although of low power rating and a different design.

If the reader supposes that they were happy at such a turn of events, he is mistaken. The plant's workers took on this assignment under a great deal of pressure: they could not circumvent the decisions of the USSR Gosplan and the USSR Committee for Science and Technology, which had determined the task for the Machine Tool Ministry--to organize series production of these units in Lyudinovo, and for last year--to fabricate a batch of hydraulic motors for production adjustment.

It looks like they do not want to comply with the assignment. The plant keeps sending letters to the ministry and the Gosplan, in which they substantiate the impossibility of fabricating and testing the hydraulic motors by the dates establishent: complete design documentation is lacking, no stock has been ordered, there are no machines or test stand equipment.

Chief engineer V. Volkov wrote that in general, in order to fulfil a production order, at least two years are needed "from the moment of furnishing a complete set of design documentation to the manufacturer." With all its "superficial solidity," the argumentation was naive in the extreme. After all, there was no talk of mass production, but of a production adjustment series consisting of ten units. To anticipate, I can say that in general, all planned production deadlines were maintained.

So, with a more favorable approach to the matter on the part of the plant officials, all these discrepancies could have been resolved through normal working procedures. But this did not happen. Why? The difficulties were deliberately exaggerated. In regard to the technical documentation and the degree of its readiness, special sessions were held at the USSR Gosplan and Gosstandart. Following this, the Mining Institute coordinated the technical documentation with the VNIIgidroprivod, the country's leader in hydraulic equipment.

There was another stumbling block. The staff of the GSKTBG [main special plant design bureau] at the Lyudinovo Assembly Plant refused to accept the drawings.

They had their own reasons for this. They lay claim to being independent in decision-making and to a leading role on issues of developing special hydraulic equipment. They are called the leading special technological design bureau for hydraulic equipment and are an autonomously financed organization, although in 15 years of their existence they have not designed a single original machine. Everything tney have done is a modification of inventions of long ago... This is what is indicated by an objective analysis by specialists.

"Let them first conduct testing at the Mining Institute and confirm the operational capabilities of the units, and then we will sign the technical documents," said GSKTBG Chief Engineer V. Gordeyev. The position of the staff of the Mining Institute imeni Skochinskiy is different. "We will be pleased to conduct all the testing," says the chief of the special design bureau of the Institute, Doctor of Technical Sciences A. Rogov, "only build the motors more quickly and turn them over to us. We will run them in on test stands, and the plant workers during this time will be busy preparing the production line for the next series." In other words, cooperate in eliminating all encountered difficulties and proceed quickly to the outlined objective. After all, these motors are awaited in many sectors.

But the stubborn "concern" of the GSKTBG staff and the plant about working by the rules has supplanted the work itself. Even the hydraulic motors which were built were turned over to the Mining Institute imeni Skochinskiy with delays. And the last units were sent to the institute for testing in May of this year. And during the testing, production defects were discovered which the institute staff itself is unable to correct. A part of the motors was taken back to Lyudinovo by the plant workers for remanufacture. In a word, there is no interest in coordinated action.

It would seem that the Ministry of the Machine Tool and Tool Building Industry must help the enterprise to overcome the difficulties, inertia, and the habit of working in the old ways. In this case, assimilation of new equipment is also a campaign for the good name of the new plant.

departments are housed in comfort, I often saw a colorful stand "History of the plant 1968-1983," which was set up in the corridor. There still were no photographs, drawings or signatures displayed. Honestly, there was something symbolic there. For the enterprise this is not a simple story. And in many ways it must be written anew. But I am sure: it will still teach the Lyudinovo workers a great deal.

2388
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LOCAL CARPATHIAN UKRAINE EFFORTS SUCCEED IN FURTHERING SCIENTIFIC-TECHNICAL PROGRESS

Kiev RABOCHAYA GAZETA in Russian 17 Jul 84 p 2

[Article by I. Lyakhov, first secretary of the Ivano-Frankovsk Obkom of the Ukrainian CP "With Little Scientific Potential," The Party Committee: Work Style]

[Text] The objective advanced by the party of intensification of social production requires effective measures to accelerate scientific and technical progress. And here there should be a full measure of manifestation of the motive force of science, the effectiveness of scientific developments, the rate of their introduction into production, and consequently the returns as well. Of considerable importance, naturally, is the question of what scientific potential supports the economy.

It is not by accident that I started this discourse. The potential of science in the Carpathian region is in no way comparable to the scientific base of the major industrial centers of the republic. There are only three VUS's operating in our oblast as well as 22 scientific research and project-design establishments--basically branches and departments of all-Union and republic ones, including three subdivisions of the UkSSR Academy of Sciences. And if such sectors as the oil and gas extraction, forestry and wood working, and agriculture have fairly good scientific facilities, the same cannot be said of many others, especially of sectors which have received quite rapid development in recent years--machine building, particularly machine tool building, as well as agricultural machine building, instrument making, radio electronics and electrical equipment. There are problems here, and they need to be solved.

For this purpose it is important to make maximum use of the opportunities of functioning scientific establishments, in all possible ways developing ties between production collectives and academic centers and scientific establishments of other cities. It is precisely to this that the party obkom directs the efforts of party organizations, scientists and production workers. This is one of the basic directions of the activity of the council for assistance to scientific and technical progress which has been organized in association with the party obkom, and which essentially functions as the coordinating body for all this work.

As the result of the efforts undertaken, the volume of scientific research, project design and technological work performed by scientific organizations of the oblast has noticeably increased in recent years. It has increased by five percent since the beginning of the current five-year plan period alone. Of course, this figure by itself says very little. But behind it are interesting, truly creative people, their indefatigable search, as well as their accomplishments, the importance of which is felt by many working collectives, and not just in our oblast alone.

Here is an example. Many people know what critical and depressing situations sometimes arise at drilling sites. For whole months the workers were building difficult kilometers of road to the oil-bearing depths of the earth. And suddenly it becomes necessary to fix an unexpectedly arisen emergency situation: the drilling pipe broke at a connection joint. The complicated and expensive operation of extracting the pipe from the borehole reduced the efforts of the brigades to zero. But after all, such accidents have occurred frequently in the country.

This is why this problem interested the scientists at the Ivano-Frankovsk Oil and Gas Institute. The search of the specialists turned out to be fruitful. The first installation permitting forecasting of the slightest fatigue cracks in the threaded connections was designed. The technical innovation was quickly placed in production. After it became widely used, the number of failures was significantly reduced. It must be noted that the develeloped installation has no domestically produced equivalents, and is superior to foreign counterparts in many of its parameters.

The Nedra special design technology bureau, which has become an important link between science and production, has already been operating for about ten years. Twelve institute departments participate actively in its work. Scientists are engaged in research on 130 contractual agreement projects.

For a number of years experimental series of products have been manufactured at a test production facility, immediately finding consumers. In 1973 the economic gain from the activities of the scientists at the institute did not exceed 4 million rubles, but last year this already reached 19.4 million rubles. Many developments by the staff of the institute and the bureau possess worldwide preeminence. As an example, modernized Zond-3 installations are operating today in India, Lebanon and Iran.

In recent years the scientists of the institute have considerably expanded the range of their research projects. In particular, developments in the area of machine building led to an urgent need to search for and implement optimum techniques of mechanization and automation of labor-intensive processes and an expanded use of robots and robotic equipment complexes.

The scientists of the institute tackled this important task with full responsibility. They thoroughly studied the problems of concern to the production workers, and outlined the directions for joint action. On the initiative of the party obkom the Machinostroyeniye [machine building] study, scientific and production complex was organized in the oblast, and already has many good works

to its credit. As an example, last year alone the Karpatpressmash [Carpathian press forging] Production Association saved 200 tons of metal and showed a rise in labor productivity through implementation of a number of optimum design and production process developments in the production of press forging machines.

The party obkom devotes special attention to improvement of the coordination of the activities of scientists and production workers in order to make more full use of the creative potential of the oblast. In the Carpathian region an effective system of territorial management of scientific and technical progress through councils for assistance to scientific and technical progress, attached to the oblast party committee and to gorkoms and raykoms, has been established. These are subdivided into sections and councils for special purpose comprehensive programs in accordance with the recommendations of the Ivano-Frankovsk sector of the Economics Institute of the UkSSR Academy of Sciences. At present there are 13 Union-wide scientific-technical, and 5 regional special purpose programs under way in the oblast. Four of these are directed at conservation of energy, raw and other materials, taking into account that the industry of the oblast is primarily of a resource-consuming nature. Objectives of increasing the effectiveness of utilization of rolled metal stock and local labor, raw material and mineral resources are also being attained.

However, the most noteworthy phenomenon has been the implementation of the comprehensive Les [forest] special purpose scientific and production program. In 1980 the CPSU Central Committee approved the performance of the Ivano-Frankovsk obkom of the Ukrainian CP on mobilization of forestry industry workers toward efficient utilization of local timber raw material resources. In developing this, the scientists of the Ivano-Frankovsk Project Design Institute of the UkSSR Ministry of the Timber and Wood Products Industry, the Carpathian branch of the Ukrainian Scientific Research Institute of the Forestry Industry and Agricultural and Forest Land Reclamation, and the staff of the Prikarpatles Production Association are carrying out the objectives of developing wastefree production process technologies and the efficient scientific utilization of forest resources.

Here is just one example. The weight method for determining timber quantity, which is already in wide use at the forestry products combines of the oblast and which was developed by innovators of the Ivano-Frankovsk Technological Project Design Institute, is now widely used in the country. The point here is not just the 67,000 rubles of economic gain attained. The innovation made it possible to measure the quantity of thin-sheet wood products, which are practically impossible to measure with the traditional method.

The orientation toward scientific and technical progress facilitates to a considerable degree the successful attainment of the goals outlined by the production association. The output production increase during three years of the five-year plan period was 20.9 percent compared with the planned 17.1 percent. The plan for increasing labor productivity has been considerably exceeded, and additional output in the amount of 21.4 million rubles has been produced. This year too the forestry workers are laboring without stoppages.

At the March general meeting of the Academy of Sciences of the republic, member of the Politburo of the CPSU Central Committee, First Secretary of the Ukrainian CP Central Committee comrade V. V. Shcherbitskiy emphasized that one of the most important criteria of the maturity of a leader and his suitability for the position occupied must be his practical actions in attaining the goals of scientific and technical progress, and the cause would be significantly served if each leader would take on at least one or two new developments which are most needed in production, and personally see them through to their broad implementation.

In the party obkom we attentively become acquanted with each management leader and study his business qualities. Various forms are used for this: business talks are held with secretaries, and the situation in each sector department is thoroughly studied. We are also engaged more substantially in the training of backup personnel: many promising young workers are invited to work in the oblast council for assistance to scientific and technical progress, and are given assignments to prepare issues for discussion by the obkom party buro. And it must be noted that in those places where the directors and sector managers have favorably faced the introduction of everything that is new and progressive, the results of labor are more substantive than in other collectives. Here, for example, is the Geofizpribor [geophysical instrument] Production Association. Since the beginning of the current five-year plan period about 50 robots and manipulators have been placed in operation. In addition, the production innovators put to use over 290 suggestions aimed at production mechanization.

Presently we are thinking about mobilizing all the creative motive forces of science to the attainment of concrete results in the national economy. For this reason it is not by chance that issues of introducing scientific developments into production have been repeatedly discussed at sessions of the party obkom buro. Experience has convinced us of the advisability of holding oblast-wide scientific and practical conferences and seminars.

The success of the matter, of course, does not depend on pretty speeches. Any presentation is worth zero if the thoughts expressed in it are not realized in practice. For this reason the sector departments of the party obkom monitor the realization of all proposals expressed at conferences and aktiv meetings.

In recent years we have often noted the performance of the production association Kolomyyasel'mash [Kolomyya agricultural machinery] in which the quality of science determines to a great degree the brand quality of the enterprise. A few years ago the self-contained PEA-1.0 Karpatets loader-excavator was developed at the special design bureau within the plant. This high-performance machine has no equivalents in our country, and competes successfully with the best foreign units. The designers of the plant used more than ten of their own inventions in the new unit. The first experimental loaders drew high praise of agricultural machinery operators. But then there was still a long way to go to the output of a series production model.

Here is where General Director N. N. Shinkarenko, Chief Engineer A. N. Glinskiy, Chief Designer B. P. Dubovetskiy as well as his deputy N. K. Chernousov showed

genuine party-like persistence in organizing a changeover to the production of a more advanced machine which surpasses the series production machine many times over in output and performance.

Today the Kolomyyasel'mash association is expanding, new production capacities are being built for an output of 18,000 PEA-1.0 machines annually in the nearest future. The Karpatets series production machines are already being sent to the kolkhozes and sovkhozes of the country. But for the designers there is still a large field left for further research and improvements. And here is where assistance is needed, primarily that of scientific workers. However, the machine builders are not yet able to find such a contact with either specialists of the Oil and Gas Institute, or sector specialists of the Institute of Applied Problems of Mechanics and Mathematics of the UkSSR Academy of Sciences. In this connection, members of the council for assistance to scientific and technical progress have also a great deal of work to do. The pace of organizing the output of the new machine of such importance to agriculture is also affected by the fact that non-standard equipment has still not been developed for production capacities to be commissioned. We would like that the Kiev Giprosel'mash [State Institute for the Design of Agricultural Machinery Plants] Institute would take up this question jointly with the designing plant and specialized institutes.

Unfortunately, cooperation between the institutes of the Western Scientific Center of the UkSSR Academy of Sciences and machine building enterprises is poorly developed and does not produce the desired results. One of the main reasons for this is the absence of firm contractual agreement bases.

Or another question. The Oil and Gas Institute presently has over 600 inventions in its portfolio. Many of these are interesting. But at best they become the property of individual production associations. Interest in the dissemination of the results of science could be to a certain degree facilitated by the transfer of the institute to an autonomously financed system of organization of operations in the development, production and assimilation of new equipment on the basis of production orders. And why could the Ministry of Higher Education of the republic not resolve this issue even as an experiment? The benefit to the national economy from such an organization of matters would be quite tangible.

Actually, there are still many problems at the juncture of science and production. And these are serious problems. They can be resolved only with consistent implementation of the directives of the February and April (1984) Plenums of the CPSU Central Committee and the decree of the CPSU Central Committee and the USSR Council of Ministers "Measures to accelerate scientific and technical progress in the national economy." The oblast party organization is working on this with persistence and a full measure of responsibility.

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WORKS SUBMITTED FOR 1984 BELORUSSIAN STATE PRIZES IN SCIENCE, TECHNOLOGY

Minsk SEL'SKAYA GAZETA in Russian 8 Sep 84 p 3

[Article: "From the Belorussian SSR Committee for State Prizes in Science and Technology"]

[Text] The Belorussian SSR Committee for State Prizes in Science and Technology reports that the following works have been admitted to participation in the competition for the 1984 Belorussian SSR State Prizes:

In the Area of Science

1. A. M. Goncharenko (supervisor of the work), V. A. Karpenko, V. P. Red'ko. "Planar Optical Waveguides." (A series of works.)

Submitted by the Institute of Physics of the Belorussian SSR Academy of Sciences.

2. V. V. Klubovich, V. P. Severdenko (posthumously), A. V. Stepanenko. "The Elaboration of the Scientific Principles of the Use of Powerful Ultrasound in the Technological Processes of the Machining of Metals." (A series of works.)

Submitted by the Belorussian Polytechnical Institute.

3. N. S. Kozlov (supervisor of the work), L. V. Gladkikh, K. A. Khavnerko, S. I. Kozintsev, V. A. Serzhanina, V. A. Tarasevich. "The Development of New Catalytic Methods of Synthesizing Nitrogen-Containing Organic Compounds."

Submitted by the Institute of Physical Organic Chemistry of the Belorussian SSR Academy of Sciences.

4. K. N. Anishchenko, I. N. Usov, A. K. Ustinovich, R. E. Mazo. "A Set of Works on the Protection of the Health of Children, the Reduction of the Illness Rate and Child Mortality in the Belorussian SSR."

Submitted by the Belorussian SSR Ministry of Health and the Belorussian Scientific Research Institute of Mother and Child Welfare.

5. N. V. Turbin (supervisor of the work), V. Ye. Bormotov, Ye. A. Bychko, L. N. Kaminskaya,, O. O. Kedrov-Zikhman, B. F. Matrosov, A. I. Palilov, V. K. Savchenko, L. A. Tarutina, L. V. Khotyleva. "The Genetics of Heterosis and the Means of Its Use in Plant Selection." (A series of works.)

Submitted by the Institute of Genetics and Cytology of the Belorussian SSR Academy of Sciences.

6. K. K. Atrakhovich (supervisor of the work), A. Ye. Bakhan'kov, I. I. Kramko, N. N. Krivko, N. P. Loban, M. R. Sudnik. "Russko-belorusskiy slovar'" [A Russian-Belorussian Dictionary] in two volumes (Minsk, Izdatel'stvo "BELSE",1982).

Submitted by the Institute of Linguistics imeni Yakub Kolas of the Belorussian SSR Academy of Sciences.

7. Ye. M. Babosov, K. P. Buslov (posthumously), E. K. Doroshevich, O. I. Yefremova, V. M. Konon, N. S. Kupchin (posthumously), A. S. Maykhrovich, N. N. Mokhnach, S. A. Podokshin, Ye. S. Prokoshina. "A Series of Works on the History of Philosophy and Social Thought of Belorussia."

Submitted by the Institute of Philosophy and Law of the Belorussian SSR Academy of Sciences.

In the Area of Technology

1. V. V. Abramchik, L. K. Artemenko, B. I. Garasevich, D. I. Golubev, M. T. Gumenyuk, S. A. Korolevich, V. F. Serpov, A. V. Skvorchevskiy, V. G. Khananayev, N. G. Yakubenko. "The Introduction of Robotics at the Minsk Timepiece Plant."

2. A. G. Aleksandrovskiy, L. F. Drobyshevskiy, V. I. Krayevoy, D. P. Krayevskiy, A. A. Petukhov, L. Z. Pisarenko, O. F. Rombal'skiy, I. A. Rusakov, N. A. Fonshteyn, L. A. Shevchuk (posthumously). "Research, Development, Industrial Assimilation and Introduction in Mass Production of Parts Made From New Antifriction Cast Iron for Diesel Engines of Agricultural Tractors and Machines for the Purpose of Increasing Their Durability and Saving Material, Energy and Manpower Resources."

3. G. V. Andreyev, E. A. Vorontsov, V. A. Klushin, Ye. M. Makushok, Ye. T. Murashko, V. I. Sadko, N. M. Skrebets, N. R. Shakhovets, S. M. Shimulevich, V. Ya. Shchukin. "The Study of the Process of Cross-Taper Rolling, the Development of a Low-Waste Technology of the Production of Parts of Agricultural and Other Machines, the Development and Introduction of Highly Productive Automated Complexes at Enterprises of the Republic and the Country."

4. N. N. Anishkevich, A. L. Karayev, L. S. Lamnev, V. P. Malyshevskiy, Ya. N. Misteyko, A. D. Rychago, V. N. Soroka, N. V. Staroverov, O. K. Tverdov, V. I. Khomich. "The Development and Series Assimilation of a New Generation of Highly Productive Equipment and the Development on Its Basis of the Completely Automated Large-Series Production of Items of Microelectronics."

5. B. N. Bulyak, S. A. Vernikovskiy, L. I. Gurskiy, Ye. A. Ivanyuta, Ye. M. Kostenko, N. V. Rumak, S. A. Soroka, V. P. Sergeyev, N. N. Tsedrik, A. G. Chernykh. "The Development of the Scientific Principles, the Elaboration of the Technology and the Organization of the Highly Profitable Mass Production of Low-Threshold Large Integrated Circuits on Silicon-Metal-Oxide-Semiconductor Structures."

6. A. M. Mazurenko (supervisor of the work), M. A. Kozlovskiy, A. A. Leusenko, V. N. Sashenko. "The Development and Introduction of Superhard Tool Materials Like 'Belbor'."

Textbooks for Higher Educational Institutions

1. I. K. Lopatin. "Osnovy zoogeografii" [The Fundamentals of Zoogeography] (Minsk, "Vyscyshaya shkola", 1980).

Submitted by the Belorussian SSR Ministry of Higher and Secondary Specialized Education.

The Belorussian SSR Committee for State Prizes in Science and Technology appeals to the executives of scientific institutions, higher educational institutions, scientific and scientific and technical societies, production associations, enterprises, ministries and departments to hold the public discussion of the indicated works and collectives of authors.

Please send criticisms, materials of discussions, suggestions and remarks on the works and collectives of authors to the Belorussian SSR Committee for State Prizes in Science and Technology by 15 October of this year at the address: 220072, Minsk, Leninskiy prospekt, 66, Room 317. Telephone 39-54-56.

7807
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BOOK EXAMINES ACCELERATION OF SCIENTIFIC, TECHNICAL PROGRESS

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 4, Apr 84 pp 88-89

[Review by Corresponding Member of the Ukrainian SSR Academy of Sciences V. Golikov and Candidate of Economic Sciences L. Lyakh of book "Uskoreniye nauchno-tekhnicheskogo progressa (organizatsiya i metody)" [The Acceleration of Scientific and Technical Process (Organization and Methods)] by V. A. Pokrovskiy, "Ekonomika", Moscow, 1983, 216 pages: "The Acceleration of Scientific and Technical Progress"]

[Text] The decisive turn toward the use of intensive factors of economic growth at the stage of mature socialism, which is characterized by the combination of the achievements of the scientific and technical revolution with the advantages of the socialist economic system, predetermines the need for the further improvement of the organizational planning and economic mechanism of the management of scientific and technical progress, to the theoretical principles and practice of the functioning of which the book of V. A. Pokrovskiy is devoted.

The author focused the main attention on the theoretical problems of the acceleration of scientific and technical progress, on the optimization of the structural interrelations of the scientific and technical potential and the production potential, the methods of the intensification of scientific activity and the forms of the management of intersectorial, sectorial and regional relations in the sphere of the development of science and technology.

Such elaborations are topical and are of great practical importance in light of the tasks, which were posed by the 26th party congress, the November (1982) and June (1983) CPSU Central Committee Plenums on the questions of the cardinal increase of labor productivity on the basis of the extensive and rapid introduction in practice of the achievements of science, technology and advanced know-how.

Studying the structural interrelations of scientific and technical progress and current production from the point of view of the formation of the optimum structural proportions of the development of the national economy, the author convincingly demonstrates the need for the strengthening of the connection of the plans of the development of science and technology and the production plans. It is possible to achieve this, as the author correctly notes, only by

such an arrangement of the management of scientific and technical progress and of its core, planning, when a decisive role will belong to the plans of scientific and technical development, which incorporate the future growth of the efficiency of social production. When analyzing the prevailing practice of planning its division into two parts and the lack of the adequate coordination of the production plans and the plans of the development of science and technology, as well as the inequality of the latter are noted. The improvement of the organizational structure of the management of scientific and technical progress at all its levels is regarded as the most important direction of the overcoming of this shortcoming.

An important place in the book is assigned to the forms and methods of the efficient organization of scientific activity as the basis of the acceleration of scientific and technical progress. On the basis of much statistical material a thorough analysis of the state and nature of the scientific and technical potential is made, the trend toward the stabilization of the proportion of the expenditures on science in the national economy and the improvement of the internal structure of these expenditures by means of the leading increase of the expenditures of equipment and the creation of pilot, experimental basis are noted.

In the work the general theoretical assumptions and the basic principles of the construction of a cost accounting system of the management of scientific and technical progress are presented, the experience of the development of a cost accounting system of the organization of work on new equipment, which has been gained in a number of sectors of industry and associations of the scientific and technical type, is generalized, the directions of the further improvement of the cost accounting system of the management of scientific and technical progress in connection with the tasks of the changeover of the economy to the intensive means of development are shown.

Unfortunately, the elaboration of these questions is characterized by a certain logical incompleteness due to inadequate consistency in the implementation of the comprehensive approach. It is necessary at present, so it seems to us, to concentrate the efforts of economic scholars and the specialists of planning and economic organs precisely on the comprehensive improvement of the cost accounting mechanism of the management of production and scientific and technical progress.

The author is inclined to examine the question in such a way that complete cost accounting is inapplicable to the activity of scientific and technical organizations, that cost accounting in science has its own nature and forms of realization, which are different from physical production, and that it can be a question here only of individual elements of it. But the complexity, conditionality and unwieldiness of the prevailing cost accounting mechanism, which the author indicates (p 70), also stem precisely from this. While noting the need for the formulation and extensive use of prices for research and development, the author does not see that this suggestion precludes the use of the economic impact as the basic source of the formation of the economic stimulation funds of scientific and technical organizations. On the other hand, the thorough elaboration of the question of the advisability of allocating to the scientific and technical organization internal working

capital and the methods of its rate setting places in doubt the need for the creation of unified funds for the development of science and technology, to the mechanism of the formation and use of which much attention is devoted in the book.

The question raised in the book about the advisability of changing over to the planning of the wage fund per ruble of the amount of work being performed with the use of the saving for the increase of salaries and the payment of bonuses to workers for high results of activity is very important for practice. The value of these recommendations would have increased immeasurably, had the author given scientifically sound recommendations on the evaluation of the amount of work being performed with allowance made for its quality, technical and economic level and economic efficiency.

In the book the place of goal program methods in the existing system of planning, as a tool of the prompt solution of priority socioeconomic problems, is revealed, a classification of scientific and technical programs is given, the experience of their formulation is generalized, the peculiarities of the accomplishment of organizational economic tasks under the conditions of the goal program management of scientific and technical progress are presented. The proposed comprehensive approach to the solution of the problems arising when formulating programs, which includes the selection and evaluation of scientific and technical problems, the determination of the end socioeconomic results and the organizational planning methods of their solution and the methods of monitoring the progress of the implementation of the programs, is of interest. The question of the means of the coordination with respect to dates, resources, performers and directions of scientific and technical development of the programs and plans of the development of science and technology is very important for practice. However, it is covered too briefly.

The book under review is an appreciable contribution to the study of the economic problems of the acceleration of scientific and technical progress.

FOOTNOTE

1. V. A. Pokrovskiy, "Uskoreniye nauchno-tekhnicheskogo progressa (organizatsiya i metody)" [The Acceleration of Scientific and Technical Progress (Organization and Methods)], Moscow, "Ekonomika", 1983, 216 pages.

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